4.0 ENVIRONMENTAL CONSEQUENCES OF ALTERNATIVES

4.1 INTRODUCTION

This chapter presents the environmental consequences of the management actions proposed under the four alternatives described in Chapter 2. These management actions were developed to look at a full range of reasonable options in the management of the public lands within the current Moab planning area (MPA), including management and allocation of public land resources, their uses, and protection. BLM decisions about resource use and management in the MPA will be based on this analysis.

Four alternatives are analyzed. Alternative A (No Action) would be a continuation of existing management practices defined in the Grand Resource Management Plan (BLM 1985a) as amended. Alternative B would offer more protection for wildlife and other natural resources, and favor natural systems over commodities development. Alternative C (Preferred Alternative) would protect important environmental values and sensitive resources while allowing commodities development. Alternative D would emphasize commodities development over the protection of natural resources.

This RMP/EIS provides a landscape scale, "big picture" level of analysis, and in most cases the exact locations of projected development and other changes are not known at this time. The analysis in this chapter is an impact analysis of the alternative management actions and prescriptions as they impact the affected environment. Impacts are defined as modifications to the existing environment brought about by implementing an alternative. Impacts can be beneficial or adverse, result from the action directly or indirectly, and can be long-term, short-term, temporary, or cumulative in nature.

For the analysis, BLM staff used existing data, science, current methodologies, professional judgments, and projected actions and levels of use. The analysis takes into account the stipulations described in Chapter 2.

4.1.1 ORGANIZATION OF CHAPTER

Chapter 4 details the environmental consequences of program decisions on each listed resource or resource use. Resources and resource uses are presented in alphabetical order. The environmental consequences of the decisions imposed by other programs on that resource are delineated for each of the four alternatives. For the majority of resources, the organization of the section lists the impacts of each of the other programs' decisions on the resource, and then lists impacts for each of the four alternatives. For example, the impacts of recreation decisions on riparian resources are listed by the decisions imposed by recreation under each of the four alternatives:

Riparian Resources

Impacts of Recreation Decisions on Riparian Resources

Alternative A
Alternative B
Alternative C
Alternative D

Resources organized in this format include Fire Management, Minerals, Non-WSA Lands with Wilderness Characteristics, Paleontology, Recreation, Riparian, Socioeconomics, Soils/Watershed, Special Designations, Special Status Species, Travel Management, Vegetation, Wildlife and Fisheries, and Woodlands.

For six of the resources (those unimpacted by a large number of program decisions), the impacts are presented by each of the four alternatives. It was determined that the environmental consequences on these resources were more understandable using this format. For example, the impacts on Lands and Realty of decsisions made under Alternative A are presented as a whole:

Lands and Realty

Impacts of Alternative A
Impacts of Alternative B
Impacts of Alternative C
Impacts of Alternative D

Resources organized in this format include Air Quality, Cultural, Health and Safety, Lands and Realty, Livestock Grazing, and Visual Resources.

Sections entitled "Management Common to All" address impacts from actions to be carried out for that resource under all alternatives (that is, the action is common to Alternatives A, B, C, and D, and thus the impacts associated with that action would apply under all alternatives). Sections entitled "Management Common to All Action Alternatives" address impacts from actions to be carried out for that resource under Alternatives B, C, and D. That is, these decisions would be common to all except Alternative A, which is the No Action Alternative.

The reader is invited to utilize the Table of Contents as an outline while reading Chapter 4.

4.1.2 Analytical Assumptions

The following are the general assumptions used for assessment under all alternatives. Assumptions associated with a single issue (e.g., wildlife habitat) are included within the alternative discussion for that issue.

- All resource actions recognize valid existing rights.
- The entire MPA is assigned one of the following leasing categories for oil and gas development:
  - Open Subject to Standard Lease Terms and Conditions
  - Open Subject to Timing Limitation and/or Controlled Surface Use Stipulations

  - Open with a No Surface Occupancy Stipulation
  - Closed
- BLM would have the funding and work force to implement the selected alternative.
- All lands identified for disposal meet FLPMA disposal criteria and can be considered for land tenure adjustments. Site-specific analysis is required for all parcels to determine that disposal is appropriate.
- Demand for recreational activities (both dispersed and concentrated), energy production, vegetative resources, and wildlife use (non-consumptive and consumptive) would increase.
- Short-term impacts are those that would last for fewer than 5 years.
- Long-term impacts are those that would last for 5 years or more.
- State highways and Class B roads through the MPA will remain open.
- All decisions, projects, activities, and mitigation for the alternatives would be completed as described in Chapter 2 and Appendix C (Surface Stipulations Applicable to all Surface Disturbing Activities).
- Acreages were calculated using GIS technology; there may be slight variations in total acres between disciplines. These variations are negligible and will not affect analysis.
- All acreages and percentages presented in this chapter pertain to BLM lands only within the MPA, unless otherwise specified.
- Non-BLM lands would be minimally directly impacted by RMP decisions since BLM does not make land decisions on non-BLM lands.
- Reasonable access to State lands, across BLM lands, would be provided under all alternatives.

4.1.3 Assumptions and Methodology for Minerals Development Impacts

A mineral potential report (MPR) was written in cooperation with the Utah Geological Survey for the Moab Field Office (MFO) in July 2005. The report outlined the potential for occurrence and development and included a reasonably foreseeable development (RFD) scenario of all mineral resources within the MPA In addition, a detailed RFD scenario report for oil and gas was prepared for the MFO in August 2005 with a revision added in September 2006.

An RFD is a long-term projection of exploration, development, production, and reclamation activity for the next 15 years. A projection of 15 years was utilized because a longer projection (up to 20 years) becomes too speculative. For example, after the RFD for oil and gas was completed in 2005, the price of oil and gas increased significantly which manifested in a corresponding escalation in development that was not anticipated. This resulted in the need to revise the RFD in September 2006. Consequently, if the projections used in this impact analysis are significantly exceeded at some time in the future due to a continual increase in oil and gas prices, then the analysis will have to be updated again.

4.1.3.1 OIL AND GAS

The MPA was divided into seven Reasonably Foreseeable Development (RFD) areas based on the geology, the potential for mineral occurrence, and the potential for mineral development (see Map 3-16). The potential for future oil and gas development and the associated surface disturbance is presented by RFD area in Table 4.1. This activity includes potential mineral development on State, Private, USFS, Tribal, BLM, NPS, and USFS-administered lands within the MPA and is the baseline for impacts analysis by alternative.

Table 4.1. Predicted Oil and Gas Development and Associated Surface Disturbance for Each RFD Area within the MPA (All Lands)

RFD Area	Number of Wells Projected to be Drilled	Estimated Future Surface Disturbance from Drilling Wells (acres)
Book Cliffs (per year)	3–15	45–225
Greater Cisco (per year)	3–30	45–450
Roan Cliffs (per year)	0–1	0–15
Salt Wash (per year)	0–2	0–30
Big Flat-Hatch Point (per year)	3–5	45–75
Lisbon Valley (per year)	2–8	30–120
Eastern Paradox (per year)	1–7	15–105
Totals per year for next 15 years	12–68	180–1,020
Average per year for next 15 years	40	600
Total for next 15 years	**600**	**9,000**

Source: BLM 2005f.

Predicted surface disturbance for oil and gas development by alternative on BLM lands only (versus all lands) was calculated by multiplying the percent of BLM lands open for development under each of the alternatives by the total number of wells predicted for all lands within the RFD area. For oil and gas, the resultant number of wells was multiplied by surface disturbance assumptions per well (assumed to be 15 acres of disturbance per well) to arrive at total disturbance (Table 4.2). Geophysical disturbances were calculated in the same manner except for the omission of well numbers and are presented in Table 4.3. It should be noted that the total number of wells cited in the RFD report does not represent upper limits on the number of wells that could be drilled in the MPA during the life of the plan. The RFD well totals were developed for the purpose of assessing impacts for decision-making. The total number of wells permitted will be determined through site-specific NEPA analysis of field development projects.

Table 4.2. Summary of Predicted Surface Disturbance for Oil and Gas Activity on BLM Lands Only

	Alternative A	Alternative B	Alternative C	Alternative D
Book Cliffs				
Avg. Number of Wells over 15 years	104	64	104	105
Avg. Surface Disturbance/yr.	104	64	104	105
Avg. Surface Disturbance/LOP	1563	960	1556	1575
Greater Cisco				
Number of Wells over 15 years	196	85	197	197
Avg. Surface Disturbance/yr.	196	85	197	197
Avg. Surface Disturbance over 15 years	2941	1275	2962	2962
Roan Cliffs				
Number of Wells over 15 years	2	1	2	2
Avg. Surface Disturbance/yr.	2	1	2	2
Avg. Surface Disturbance over 15 years	30	11	27	29
Salt Wash				
Avg. Number of Wells over 15 years	13	11	11	12
Avg. Surface Disturbance/yr.	13	11	11	12
Avg. Surface Disturbance over 15 years	189	159	171	186
Big Flat-Hatch Point				
Number of Wells over 15 years	46	19	34	44
Avg. Surface Disturbance/yr.	46	19	34	44
Avg. Surface Disturbance over 15 years	697	292	508	665
Lisbon Valley				
Number of Wells over 15 years	56	54	56	56
Avg. Surface Disturbance/yr.	56	54	56	56
Avg. Surface Disturbance over 15 years	840	813	836	836
Eastern Paradox				
Number of Wells over 15 years	34	21	28	32
Avg. Surface Disturbance/yr.	34	21	28	32
Avg. Surface Disturbance over 15 years	512	320	423	486
Total Number of Wells over 15 years	**451**	**255**	**432**	**448**

These numbers are based on several calculations that have been pro-rated and subsequently rounded, so there may be slight discrepancies in the summary numbers. For example, under Alternatives A and C 104 wells are predicted in the Book Cliffs over the life of the plan but the resulting surface disturbance numbers are slightly different. This is a result of the base well numbers being rounded. It could be assumed under Alternative A that the well number was closer to 104.2 whereas under Alternative C the well number was closer to 103.7. Detailed information on the calculations can be obtained from the MFO.

4.1.3.2 Coal-bed Methane

Coal-bed methane development is expected to occur in the far northeastern corner of the MPA where there is high development potential. Future coal-bed methane exploration over the next 15 years is expected to entail testing at three 5-spot well clusters, or 15 new wells with a cumulative surface disturbance of about 225 acres.

4.1.3.3 Potash and Salt

Potash development in the Ten Mile area during the next 15 years is expected to entail the drilling of up to 10 new exploration wells on existing leases involving a total surface disturbance of about 50 acres.

4.1.3.4 Uranium-Vanadium

New surface disturbance for uranium activity is estimated at about 20 acres per year for a total of 300 acres of disturbance over the next 15 years. Most of this development is expected to occur within the historic mining areas rated with high development potential (Lisbon Valley and La Sal).

4.1.3.5 Copper

Copper mining at the Lisbon Valley copper mine site will continue under the approved plan for about 10 years (2016). The total surface disturbance area will amount to about 1103 acres. Exploration activities would be conducted outside the mine area involving 25 to 50 holes per year for the next 10 years involving about 2.5 acres to 5 acres. This would amount to a total of from about 25 acres to 50 acres of disturbance over the next 10 years.

Copper drilling and some small scale mining could occur along the Salt Valley anticline area involving about 20 acres of surface disturbance sometime during the next 15 years.

4.1.3.6 Sand and Gravel

Sand and gravel development is expected to occur in the vicinity of the areas where historical production has occurred. This development would amount to about 24 acres of new surface disturbance per year and about 360 acres of over the next 15 years.

4.1.3.7 Building Stone

One large-scale building stone operation is anticipated over the next 15 years in the vicinity of existing sites. This operation would result in 5 to 10 acres of surface disturbance.

4.1.3.8 Travertine

Over the next 15 years new surface disturbance at the two existing travertine sites is expected to entail about 6 acres.

4.1.3.9 CLAY

Clay production is anticipated in the vicinity of 2 existing sites over the next 15 years. New surface disturbance is estimated to range from 1 to 5 acres and would total about seven acres for both of the two sites.

4.1.3.10 HUMATE

There has been interest in developing the humate deposit at Harley Dome and the deposit is likely to see some limited development during the next 15 years. Total surface disturbance is expected to involve about 2 acres for exploration and up to 15 acres for production.

The total predicted surface disturbance associated with all mineral development in the MPA is broken out by alternative in Table 4.3. The development projected for the minerals other than oil and gas involves small acreages of disturbance which in many cases would occur on existing leases or within the vicinity of existing mine areas and sites. Therefore, the projected development for these minerals is carried across all alternatives.

Table 4.3. Summary of Total Predicted Surface Disturbance for Mineral Development Activities (acres)

Mineral Category	Alternative A	Alternative B	Alternative C	Alternative D
Geophysical	2397	1404	2072	2329
Oil and Gas	6772	3830	6483	6739
Other Leasable Minerals	275	275	275	275
Locatable	350	350	350	350
Salable	390	390	390	390
Total	**10,184**	**6,249**	**9,570**	**10,083**

These numbers are based on several calculations that have been pro-rated and subsequently rounded so there may be slight discrepancies in the summary numbers. For example under Alternatives A and C, 104 wells are predicted in the Book Cliffs over the life of the plan but the resulting surface disturbance numbers are slightly different. This is a result of the base well numbers being rounded. It could be assumed under Alternative A that the well number was closer to 104.2 whereas under Alternative C the well number was closer to 103.7. Detailed information on the calculations can be obtained from the MFO.

The assumptions for reclamation for oil and gas are that 50% of the wells drilled would be productive and 50% would be abandoned and reclaimed and revegetation would be successful within a scope of ten years. Therefore 100 wells (1,500 acres) would be reclaimed during the life of the plan. Only wells drilled during the first 5 years would be successfully reclaimed over the next 15 years (40 wells per year × 5 × 50% of wells abandoned and reclaimed = 100) (BLM 2005f).

For geophysical exploration the assumptions are that reclamation of disturbance would be successful within a scope of ten years depending on reclamation times related to soils, vegetation, and rainfall (BLM 2005f).

Surface disturbances from locatable, salable, and other mineral development would also be reclaimed but the timeframe is unknown.

4.1.3.11 Existing Oil and Gas Leases

About 820,000 acres of public lands in the MPA are currently under lease for oil and gas. These leases were issued with stipulations that were in place under the 1985 Grand RMP. Only a small percentage of these leases are currently under development or are expected to be developed. Oil and gas leases, unless held by production, are issued for a period of ten years. Undeveloped leases expire at the end of ten years. Thus, during the life of the plan, many of the existing leases will expire and will not be reissued. Any and all new leases will be subject to the management decisions in the Moab RMP. Due to these existing leases, it is possible that wells could be drilled in areas that are proposed in this plan to be managed as closed or NSO for oil and gas leasing.

4.1.3.12 Mining Claims for Locatable Minerals

Unless withdrawn from location, all public lands within the MPA are open to mining claim location under all alternatives. It is possible that mining claims could be located in areas where non-locatable minerals (oil and gas) would be severely restricted to protect important resource values. Therefore, claimants could conduct operations that would adversely impact the resources of concern. However, development in these restricted areas (NSO and closed) is not anticipated, and therefore, for this analysis, it is assumed that adverse impacts to these areas from locatable mineral development would not occur. Locatable minerals are subject to controlled surface use and timing limitation stipulations (see Appendix C) which are consistent with the rights granted under the mining laws.

4.1.4 Types of Impacts to be Addressed

Direct impacts are attributable to implementation of an alternative that affects a specific resource and generally occur at the same time and place. Indirect impacts can result from one resource affecting another (e.g., soil erosion and sedimentation affecting water quality) or can be later in time or removed in location, but are still reasonable foreseeable. Long-term impacts are those that would substantially remain for many years or for the life of the project. Temporary impacts are short-term or ephemeral changes to the environment that return to the original condition once the activity is stopped, such as air pollutant emissions caused by earthmoving equipment during construction. Short-term impacts result in changes to the environment that are stabilized or mitigated rapidly and without long-term impacts. Cumulative impacts could also occur as the result of past, present, and reasonably foreseeable future actions by Federal, state, and local governments, private individuals and entities in or near the MPA. Cumulative impacts could result from individually minor but collectively significant actions that take place over time.

4.2 Impacts to Critical Elements

The BLM's NEPA Handbook (H-1790-1) requires that all EISs address certain topics, which the BLM refers to as Critical Elements of the Human Environment. The list of elements contained in the BLM handbook has been expanded by BLM Instruction Memoranda and Executive Orders. These elements are presented in Table 4.4, followed by corresponding Relevant Authorities and the status of how the critical element is addressed in this document.

This analysis was conducted using the best-available information. This includes but is not limited to landscape level data such as GAP-level vegetation data, SSURGO soils data, and MPA information on wildlife habitat boundaries. Additional site-specific data (including cultural resource surveys, TES surveys, etc.) will be required to complete site-specific NEPA analysis necessary prior to implementation of resource management activities.

Table 4.4. Critical Elements

Critical Element	Relevant Authority	Status
Air Quality	The Clean Air Act, as amended (42 U.S.C. 7401 et seq.)	Addressed in its own section of the EIS
Areas of Critical Environmental Concern	Federal Land Policy and Management Act of 1976 (FLPMA) (43 U.S.C. 1701 et seq.)	Addressed in the Special Designations section
Cultural Resources	National Historic Preservation Act, as amended (16 U.S.C. 470)	Addressed in its own section of the EIS
Environmental Justice[1]	EO 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-income Populations	Addressed in the Socioeconomic section
Farm Lands (prime or unique)	Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.)	There is no identified prime farmland within the MPA.
Floodplains	EO 11988, Floodplain Management	Addressed in the Soil and Water section
Invasive, Non-native Species[1]	Federal Noxious Weed Act of 1974, as amended Endangered Species Act of 1973, as amended; EO 13112, Invasive Species	Addressed in the Vegetation section
Native American Religious Concerns	American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996) EO 13007, Indian Sacred Sites	Addressed in the Socioeconomic and Cultural Resource sections
Threatened or Endangered Species	Endangered Species Act of 1973 as amended (16 U.S.C. 1531)	Addressed in the Special Status Species section
Wastes (Hazardous or Solid)	Resource Conservation and Recovery Act of 1976 (42 U.S.C. 6901 et seq.) Comprehensive Environmental Response, Compensation, and Liability Act of 1980 as amended (42 U.S.C. 9615)	Addressed in the Health and Safety and Socioeconomic sections

Table 4.4. Critical Elements

Critical Element	Relevant Authority	Status
Water Quality (Drinking/Ground)[1]	Safe Drinking Water Act, as amended (42 U.S.C. 300f et seq.)	Addressed in the Soils and Water section
	Clean Water Act of 1977 (33 U.S.C. 1251 et seq.)	
Wetlands/Riparian Zones	EO 11990, Protection of Wetlands	Addressed in the Riparian and Soils and Water sections
Wild and Scenic Rivers	Wild and Scenic Rivers Act, as amended (16 U.S.C. 1271)	Addressed in the Special Designations section
Wilderness	FLPMA and Wilderness Act of 1964 (16 U.S.C. 1131 et seq.)	Addressed in the Special Designations section

[1]Critical element added by IM-1999-178 [Interim Guidance - Changes to the List of Critical Elements of the Human Environment in BLM's National Environmental Policy Act (NEPA) Handbook]

Certain resources and resource uses would not be impacted by any of the resource decisions presented in Chapter 2 and therefore they are not discussed in the subsequent analysis. Table 4.5 summarizes the resources and resource uses that would not be impacted, by program.

4.3 Environmental Consequences of Alternatives

This section presents the impacts to air quality from management actions for the resources and resource uses discussed in Chapter 2. Existing conditions concerning air quality are described in Chapter 3.

4.3.1 Air Quality and Climate

The MPA is located in a region designated as unclassifiable for PM_{10} and unclassifiable/ attainment for all other airborne pollutants [see 40 CFR Part 81] (UDAQ and EPA 2006). The alternatives discussed below have been evaluated to ensure appropriate analysis of potential impacts to air quality to the degree possible for each alternative. The impacts of implementing the management alternatives are described in detail in the following sections.

4.3.1.1 Impacts Common to All Alternatives

Certain management decisions for air quality resources apply to all alternatives. Management common to all alternatives for air quality resources relate to the application of standard State and Federal policy and regulations. These policies and regulations call for appropriate management of air quality resources within the MPA, and include application of the best air quality control technology (BACT), provided by the Utah Division of Air Quality (UDAQ), as needed to meet air quality standards; compliance with Utah Air Conservation (UAC) Regulation R307-205, which identifies appropriate dust abatement measures for construction, demolition, clearing or excavation of land areas greater than one-quarter acre in size (UAC R307-205, 01 August 2006);

Table 4.5. Resources Not Impacted by Program Decisions in Chapter 2 (X = No Impact),

Resource Title	Air Quality and Climate	Cultural Resources	Fire Management	Health and Safety	Lands and Realty	Livestock Grazing	Minerals	Non-WSA Lands with WCs	Paleontological Resources	Recreation	Riparian Resources	Soils and Water Resources	Special Designations	Special Status Species	Travel Management	Vegetation	Visual Resources	Wildlife and Fisheries	Woodlands
Air Quality and Climate		X							X					X			X		
Cultural Resources	X			X								X		X				X	
Fire Management		X		X		X			X			X				X	X		
Health and Safety	X	X	X		X	X		X	X	X	X	X	X	X	X	X	X	X	X
Lands and Realty	X		X	X		X			X										X
Livestock Grazing	X			X				X	X				X				X		X
Minerals	X	X	X	X		X									X				X
Non-WSA Lands with WCs	X			X															
Paleontological Resources	X	X		X								X		X		X	X	X	
Recreation																			X
Riparian Resources	X	X		X					X								X		
Socioeconomics	X																		
Soils and Water Resources	X								X					X		X	X	X	X
Special Designations	X																		
Special Status Species	X	X							X										
Travel Management			X	X	X	X			X	X	X	X		X			X	X	X
Vegetation	X	X		X					X								X		
Visual Resources																			
Wildlife and Fisheries	X	X							X										
Woodlands	X	X		X	X	X	X		X			X		X	X	X	X	X	

and management of emissions to prevent deterioration to air quality in Class I Airsheds (UAC R307-405, 01 August 2006).

Projected emissions common to all alternatives include particulate matter (PM_{10} and $PM_{2.5}$), CO, SO_2, NO_x, hydrocarbons and combustion by-products. Actual pollutant loads produced are dependant on the number and type of pollutant sources, source location, duration of loading, local topographical and meteorological conditions and other site-specific factors.

Under all alternatives of the MPA Draft RMP, 5,000 to 10,000 acres would be treated with prescribed fire and non-fire treatments annually across the MPA depending on budgetary and time constraints.

There are several criteria pollutants of concern specific to prescribed burning, chiefly particulate matter and carbon dioxide (CO_2). Particulate matter produced in prescribed burns is predominantly $PM_{2.5}$ (70% of the smoke produced in burns falls into this category). The generation of increased particulates is especially noticeable in high-intensity, catastrophic wildland fire. Fire also produces carbon dioxide (CO_2). Biomass burning contributes to the release of greenhouse gases (such as CO_2), and eliminates a carbon sink. The detrimental air quality impacts from wildfire would likely be greater than those from prescribed fire and exert a larger adverse effect on air quality in the MPA.

Direct impacts of prescribed fire fall into two general categories: short-term and long-term. Short-term air quality impacts projected from prescribed burns include a general increase in particulates (primarily $PM_{2.5}$), CO_2 and ozone emissions in burn areas and those locations immediately downwind. The magnitude of increase is directly dependent on the size, extent and controlled level of the burn. The type and amount of air pollutants released from burning wildland vegetation varies with type of fuel, moisture content, temperature of the fire, and the amount of smoldering occurring after the fire. Since prescribed burning occurs irregularly, it is generally possible to restrict burning in potential non-attainment areas on "bad air quality days" to avoid violating air quality standards. Long-term, direct air-quality impacts projected from prescribed burns include a general increase in airborne particulates from the burn site as a result of ash dispersion and transport. This increase would occur only until revegetation is complete and growth matures.

Indirect impacts on air quality from prescribed burns (short-term and long-term) include an increase in airborne particulates from the burn site as a result of wind-based erosion of devegetated areas. This effect is expected to be small as vegetation management is an active part of fire management techniques. Fuel reduction treatments, authorized by the LUP Amendment could potentially decrease the number and intensity of wildland fires with a concurrent "decrease" in the amount of particulates. A greater long-term effect of prescribed burning is a reduction in particulate, CO_2 and ozone emissions specific to wildfire in unmanaged areas. Ozone (a product of biomass combustion formed through the interaction of ozone precursors, volatile organic carbon compounds (VOCs), and nitrogen oxides) is a precursor to greenhouse gases, and a major constituent of photochemical smog. Although generally ozone produced by prescribed fire is quickly diluted and dispersed into the air, it may act as a contributor to the

greenhouse effect. As a criteria pollutant, ozone production may be regulated by a State Implementation Plan (SIP), or burns may be banned under ozone alerts.

BLM fire management policy is consistent with UDEQ permitting process and, as such, would be timed in conjunction with meteorological conditions so as to minimize smoke impacts. Specific policy, rules and procedures are implemented by BLM to minimize the air quality impacts and impacts to regional haze for fire events. Under these requirements, BLM would comply with the current Smoke Management Plan (SMP) and Memorandum of Agreement (MOU) between BLM, USFS, and UDAQ. The MOU, in accordance with UAC regulation R307-204, which requires reporting size, date of burn, fuel type, and estimated air emissions from each prescribed burn. All prescribed burns, mechanical, and chemical treatments and impacts would be analyzed under a project-specific NEPA compliant document.

Additional restrictions on prescribed burns and Wildland Fire Use (WFU) treatments during certain conditions or near Visual Resource Management, Class I areas would also apply. All of these restrictions could impact the size and/or timing of fire management activities such as Wildland Fire Use and or prescribed burns. However, these limitations would not substantially reduce the effectiveness of long-term fire management or increase fire risk in the MPA.

The application of fire management policy is projected to result in a reduction in available fuels and an associated reduction in wildfire severity across the treated areas, particularly in pinyon-juniper woodland and wildland/urban interfaces.

Abandoned minesites, one aspect of health and safety management decisions general to all alternatives have the potential for direct, short-term, adverse impacts on air quality. Potential impacts are specific to the remediation of abandoned mine sites determined to pose a risk to human health and safety. Remediation techniques applied generally include collapsing or sealing of open shafts and adits or capping or removing tailings or other hazardous materials. Land-disturbance associated with these practices and operation of heavy equipment during remediation could result in incremental increases in short-term concentrations of particulate matter (PM_{10} and $PM_{2.5}$), SO_2, NO_x, hydrocarbons, radio-nuclides, and combustion by-products. Actual pollutant loads produced are dependant on the number and type of emission sources on-site, relative area of disturbed earth, source location, duration of work, local topographical and meteorological conditions and other site-specific factors. Short-term impacts on air quality are expected to be small to negligible, as work would be carried out in accordance with the appropriate quality policies and regulations. Long-term impacts are projected to be negligible, as appropriate surface stabilization would be implemented in accordance with these same policies and regulations.

Specific actions for limiting activities during severe, extreme and exceptional drought conditions (as defined in Appendix M) are prescribed in the Adaptive Drought Management Plan (Chapter 2, Alternatives Matrix). Actions implemented under this plan are anticipated to help preserve and enhance existing air quality through limitations on surface disturbing activities, changes in grazing management, restrictions on OHV use and off-road events, prescribed burns and vegetative treatments, and other activity limitations that would minimize airborne particulate and preserve existing vegetative cover.

4.3.1.2 ALTERNATIVES IMPACTS

The impacts of cultural resource management decisions to inventory, protect, preserve the resource, and to comply with Section 106; paleontological decisions to protect, evaluate, support scientific research, and allow recreational collection of fossils; special status animal species management decisions to protect listed species; and visual resource management decisions to protect scenic quality would have negligible impacts on air quality because these management activities would not produce quantifiable air pollutants. Therefore, the management of these resources will not be discussed further in this section.

Impacts of livestock grazing, non-WSA lands with wilderness characteristics, riparian, soil and watershed, special designations, travel management, vegetation and special status vegetation, wildlife, and woodlands management decisions that limit or reduce surface and vegetation disturbance, grazing intensity, manage for greater vegetation retention and generation; and improve/upgrade existing roadway surfaces are generally projected to result in negligible impacts on short-term air quality and negligible to incrementally beneficial impacts on long-term air quality. Proposed management decisions, including travel management, generally include lower overall surface/soil disturbance. Potentially beneficial outcomes from these management decisions include reduced PM_{10} and other windborne particulate from erosion of exposed soils. Short-term benefits to air quality would most likely not be measurable in the overall project area. Long-term benefits would include incremental site-specific reductions in windborne particulate from reduced erosion of exposed soils as vegetation/soil cohesion improves over time. Wildlife management decisions would be based on seasonal restrictions, which would have negligible short-term impact on air quality in areas of specific wildlife habitat. Long-term impacts are generally projected to result in negligible to incrementally beneficial impacts on long-term air quality, primarily the result of limiting vehicular travel during critical wildlife periods. As the impacts of these management decisions are generally projected to be incrementally positive and not measurable on a site-specific basis, the management of these resources will not be discussed further in this section.

Impacts of land and realty management decisions, outside of those specific to compressor stations discussed below, are projected to have no significant effect on air quality except as they impact other management decisions. It should be noted that while some compressor stations are authorized by rights-of-way, most are associated with oil and gas leases. The impacts from compressor stations and other associated activities are therefore assessed collectively in Section 4.3.7 (Mineral Resources).

Impacts of recreation and mineral development management decisions are projected to have the greatest potential for impacts on air quality of the resources assessed. The projected impacts of management decisions of these resources specific to the proposed alternatives will be discussed in greater detail in the following sections of this chapter.

4.3.1.2.1 ANALYSIS ASSUMPTIONS

Mineral development potential was assessed in the Mineral Potential Report prepared for the MPA. A moderate to high development potential was identified for uranium/vanadium, and a high development potential for limestone, building stone and clay. The development potential for

sand and gravel was rated as moderate to high depending on the relative distance from an established roadway.

As mineral development is a permitted process, and a variety of multi-level regulatory processes (discussed in the introduction of this section) exist to ensure that pollutant levels do not increase above identified thresholds and/or air quality criteria, it is assumed that mineral development operations would be carried out in compliance with existing policies and regulations at both the state and Federal level. It is further assumed that roads, pipelines, excavations, and other mineral development-related disturbances in areas with soils susceptible to wind erosion would be appropriately surfaced (covering of piles where appropriate, graveling or surfactants applied to roads, etc.) to reduce fugitive dust generated by traffic and related activities. Such treatments would also be applied as appropriate on local and resource roads that represent a dust problem. Lower speed limits, enforced by the appropriate authority, would also act to limit dust in project and adjacent areas.

In the absence of quantitative data specific to localized development processes, and due to the fact that state and Federal pre-construction/excavation permitting processes are required to consider cumulative impacts of proposed and surrounding future sources to ensure that proposed sources within the project area would not contribute to exceedances of the ambient air quality standards, management decisions specific to the development of these mineral resources are not projected to generate emissions sufficient to result in noncompliance with air quality criteria. Therefore, the management of these resources will not be discussed further in this section. Development potential for all locatable, salable and leasable mineral resources in the MPA is discussed in greater detail in Section 4.3.7 (Mineral Resources) of this document.

The Reasonably Foreseeable Development (RFD) scenario prepared for the RMP identified high development potential areas for oil and gas (leasable mineral resources) within the MPA Approximately 2,027 oil and gas wells have been drilled in the MPA between 1891 and 2004 (UDOGM 2004), averaging approximately 18 wells per year.

High development areas identified within the MPA include the Book Cliffs, Greater Cisco Area, Roan Cliffs, Salt Wash, Big Flat – Hatch Point, Lisbon Valley, and Eastern Paradox (BLM 2005e; BLM 2005f) (Section 4.3.7 Mineral Resources).

To assess the potential for air quality impacts from oil and gas development, it was assumed that the average surface disturbance per existing well was representative of future well sites. In the RFD (BLM 2005f) and Mineral Potential Report (MPR; BLM 2005e), past development was used to predict future development. The total number of existing oil and gas wells (577 capable of producing oil and gas) and their associated roads and pipelines, covering a total area of 8,655 acres, were used to calculate the projected, approximate surface disturbance per well: 15 acres (BLM 2005f). In the following analysis, 15 acres is assumed to be the projected, approximate disturbance per well under each alternative.

For the purposes of this analysis, it was assumed that the number of wells likely to be drilled under each alternative would be proportional to the acreage of land open for mineral resource development under that alternative. For example, if an alternative had 90% of BLM lands in the

MPA open for development, it would be assumed that 90% of the RFD on BLM lands would be drilled under that alternative. Table 4.39 contains acreages, information on the relative percentage of BLM lands, and predicted number of wells on BLM lands both annually and over the life of the RMP for the seven RFD development areas.

Future oil and gas development over the next 15 years is projected to be between 12-68 wells per year, with an average of 40 wells per year. This assumption projects a total number (over 15 years) of 600 wells and approximately 9,000 additional acres of disturbance (BLM 2005f). Using the 15 year projection of 600 wells, the corresponding number of wells and acres of surface disturbance can be predicted for the minerals development scenario under each alternative, for BLM lands alone and/or for BLM lands and non-BLM lands. The projection of 600 wells is based on unrestricted use on all lands. The number of wells projected under each alternative (BLM lands only) would be reduced by the acres within that alternative that are subject to major restrictions (NSO or Closed), because these restrictions would preclude surface disturbance to that acreage. While special stipulations (timing limitations and controlled surface use) may impose minor restrictions, surface disturbing activities could still occur and therefore, these special stipulations would not result in a reduction in the number of wells.

Predicted number of wells and associated acreages on BLM lands within the RFD areas (Book Cliffs, Greater Cisco Area, Roan Cliffs, Salt Wash, Big Flat – Hatch Point, Lisbon Valley and Eastern Paradox), were used as the basis of analysis for air quality impacts specific to future oil and gas development within the MPA. Impacts on air quality were assessed for the lifetime of the RMP (15 years). Similar calculations were made to characterize the potential effects of geophysical exploration (disturbance of 3,600 acres caused by 2,000 linear miles of source line; BLM 2005f), and locatable and salable mineral resource development (disturbance of 350 acres caused by locatable mineral resource development and of 390 acres caused by salable mineral resource development; BLM 2005e) on BLM lands for each alternative as discussed in Section 4.3.7 Mineral Resources.

Full-scale dispersion modeling was not conducted for this analysis. Basic dispersion principles and generalized plume behavior (Walcek 2002, Holzworth 1972, Draxler and Hess 1998) were employed in a direct, calculational fashion to better understand the effect of proposed oil and gas development actions on air quality in the MPA. Conclusions reached and projections made are therefore semi-quantitative to qualitative in nature and are intended to forecast potential trends rather than identify absolute constituent concentrations. Conservative assumptions were used to better ensure that the findings do not underestimate future impacts. For example, it was assumed that all proposed wells would go into production within 15 years, and then operate at full production levels with no "dry holes" or "shut ins," while in reality a small percentage of dry holes and shut-ins would be expected to occur. All emission sources were assumed to operate at their average maximum emission rates simultaneously throughout the lifetime of the project. In reality, some sources would only emit during a portion of any given day or year. It was also assumed that primary road traffic would occur during working, daylight hours (7 AM to 7 PM), particularly during the construction period of the wells, and that 50% control of particulate emissions would be attained by watering.

For each development scenario, the number of expected compressors should be based on expected gas production, expected number of new wells per year, expected gas production potential of each well, and proximity to other wells. In the absence of yearly data, and in acknowledgement of the fact that all analyses were carried out to represent the total development through the lifetime of the RMP, the total number of wells proposed for each alternative was used. The number of compressors necessary for each alternative was calculated from an assessment of the average number of compressors (0.063 per well) required for projected oil and gas development in the Vernal FO, located to the north of the MPA (Trinity and Nicholls 2006). To accommodate the expansive distances potential between wells and the separate RFD areas, a minimum of two compressors per RFD area was assumed. The analysis assumed there would be one glycol dehydrator per gas well, with a well spacing of 40 acres.

Generalized projected emissions from compressors include CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$. Emission rates were calculated using AP-42 factors for 4-stroke lean-burn engines (EPA 2003f, EPA 2006). NO_x emissions rates for compressors were calculated based on a best available control technology (BACT) limit of 0.7 grams per horsepower hour (g/hp-hr). Emission rates calculated for each pollutant are assumed to be emitted evenly throughout the year and are displayed in Table 4.6.

Table 4.6. Emission Rates for Compressors

Pollutant	Emission Rate (g/sec)
CO	5.78E-01
NO_x	1.94E-01
PM_{10}	1.04E-02
$PM_{2.5}$	1.04E-02
SO_2	6.10E-04

An average emission rate of 1.45×10^{-7} g/sec hydrogen sulfide (H_2S) was assumed for all glycol dehydrators (Trinity and Nicholls 2006). All H_2S was assumed to convert to SO_2 (ATSDR 1999) for the purposes of this assessment.

Flaring was assumed to be required in 60% or less of the new wells. Flared gas was assumed to be "sweet" and contain no sulfur. Flaring emissions applicable to this analysis were assumed to be primarily NO_x and CO. Flaring emissions and relative percentage of wells flared were calculated using the generalized flaring emissions identified for the VFO (BLM 2004h).

Based on the previous discussion of local wind conditions, a conservative assumption of 3 mph (~1.5 m/sec) winds and an upper dispersion boundary of 50 meters (Draxler and Hess 1998) were applied.

For fugitive dust emissions, well placement and pad construction were assumed to represent the critical period for air quality impacts. Construction activity was assumed to occur during the 12-hour period from 7 AM to 7 PM. A total of 10 construction vehicles operating on-site at any one time was assumed; four of these were stationary (e.g., compressors, generators, pumps and similar equipment), and the others were assumed to be two heavy (6 tons or more), two mid-

range (3 tons), and two light duty (2 tons) mobile vehicles. Soil moisture content of 5% or less and soil silt content of 5% were assumed. Soil silt content was approximated from the relative percent silty soils affected in each alternative. Mean vehicle speed on the construction site was assumed to be 10 mph. It was assumed that all six mobile vehicles would be working at any one time on site. This scenario is assumed to be representative of periods of intense activity and, therefore, serves as a conservative estimate of critical conditions.

It was assumed that watering of all exposed disturbance areas (e.g., work areas, staging areas, and roads) on the construction site would occur as appropriate during the construction period. As soils within the project area exhibit variation in wind-erodibility, a conservative control efficiency of 37% for all exposed/graded areas and 3% for all well-traveled roadways was assumed to allow a protective estimate of critical conditions.

PM_{10} emissions specific to travel to and from the proposed well sites were assumed to occur at a lower intensity than construction emissions as well sites would be relatively disperse and presumably would not be visited simultaneously. Therefore, air quality impacts specific to post-construction operation, maintenance and public use of created roadways were assumed to be more dispersed and occur over a longer time period than represented by the more intense activity associated with construction.

Projected concentrations were not compared to PSD Class I and II increments as the limitations of the analysis preclude such. It was assumed that regulatory PSD Increment Consumption Analyses are the responsibility of the state air quality agency (under EPA oversight) and would be conducted where appropriate during permitting process.

In the development of this analysis, there was recognized uncertainty regarding the actual magnitude of final resource development. This uncertainty included the exact number of wells, type and number of equipment used, specific location of development, etc. Due to this uncertainty, actual impacts which would potentially be affected by permit requirements may vary from the projected values.

The contribution to the degradation of air quality from other [non-oil and gas] mineral development was considered nominal and oil and gas related activities were assumed to be the largest component of mineral related activity within the MPA. Therefore, only oil and gas related missions were directly considered in assessing impacts to air quality.

4.3.1.2.2 ALTERNATIVE A

4.3.1.2.2.1 Impacts of Recreation and Travel Management Decisions on Air Quality

Recreation management decisions under Alternative A would maintain existing levels of motorized vehicle use without additional constraints. Projected effects on air quality would be primarily associated with combustion byproducts from automobiles, OHVs, and other hydrocarbon-combustion based transport, and surface disturbance related to off-trail and off-road activities. Projected air quality constituents of concern specific to recreational use include particulate matter (PM_{10} and $PM_{2.5}$), hydrocarbons and combustion by-products.

As the locations of all existing and future recreation sites within the MPA are not presently known, precise quantification of air quality impacts is not possible. As the MPA is not currently experiencing non-attainment, continued recreational use at the existing level is not projected to result in long-term, project-wide exceedances of ambient air quality standards. However, if heavy recreational use occurs in a relatively small area, local conditions may exist that contribute to short-term exceedance of air quality standards or PSD increment criteria.

Impacts of recreation management decisions that limit or reduce surface and vegetation disturbance, OHV and other off-trail access; and improve existing roadway and trail surfaces are generally projected to result in negligible impacts on short-term air quality and negligible to incrementally beneficial impacts on long-term air quality. Short-term benefits to air quality would most likely not be measurable in the overall project area. Long-term benefits would include incremental site-specific reductions in windborne particulate from reduced erosion of exposed soils as vegetation/soil cohesion improves over time.

Alternative A is the least restrictive of cross country driving of all the alternatives, and therefore has the lowest associated potential benefit to air quality but is not expected to result in a substantial decrease in air quality.

4.3.1.2.2.2 Impacts of Mineral Development Decisions on Air Quality

Impacts of mineral development management decisions under Alternative A would maintain existing levels of use without additional constraints.

Four primary BLM leasing categories for oil and gas have been identified within this assessment as outlined in Table 4.38:

- Standard Lease Terms (Standard)
- Special Conditions, or Timing Limitations and/or Controlled Surface Use (Limited)
- No Surface Occupancy (NSO)
- Closed (Lands designated as closed are not available for oil and gas development activities and therefore were not included in this analysis)

Table 4.37 contains acreage information on BLM lands for the seven RFD development areas.

Based on the proportion of BLM lands open for leasing and the RFD (BLM 2005f), it is estimated that 451 oil and gas wells would be drilled over the life of the RMP (Table 4.7) under Alternative A. Surface disturbance associated with these wells is estimated to involve approximately 6,772 acres over the life of the RMP. Oil and gas development is anticipated to occur in all RFD areas but is projected to be least likely to occur in the Roan Cliffs RFD area, while the Book Cliffs and Greater Cisco RFD areas are projected to experience the greatest amount of development. The greatest density of new wells is projected to occur in the Greater Cisco RFD area. Additional information on disturbance specific to salable resources, other leasable resources, and geophysical exploration is available in Section 4.3.7.3.2 Impacts of Mineral Resource Development Decisions on Mineral Resource Development.

Calculated numbers of wells for each RFD area in Alternative A are also listed in Table 4.7.

Table 4.7. Average Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative A over 15 years

RFD Area	Average Predicted Oil and Gas Wells[1]	Estimated Compressors Necessary[2]	Estimated Glycol Dehydrators Necessary[2]
Book Cliffs	104	7	104
Greater Cisco Area	196	12	196
Roan Cliffs	2	2	2
Salt Wash	13	2	13
Big Flat – Hatch Point	46	3	46
Lisbon Valley	56	4	56
Eastern Paradox	34	2	34
Total	**451**	**32**	**451**

Note: Calculations based on BLM lands only, and are specific to the life of the RMP (15 years).

[1] The number of oil and natural gas wells was calculated as a cumulative total, not independently. For the purpose of analyzing impacts of minerals decisions on the total number of oil and natural gas wells, BLM lands designated as No Surface Occupancy (NSO) were not considered open for development.

[2] Necessary compressors were calculated at 0.063 per well (minimum of 2 per RFD area). Necessary glycol dehydrators were calculated at 1 per well (Trinity and Nicholls 2006).

Primary emission sources for oil and gas development were identified as gas-fired compressors (estimated at 0.063 per well or a minimum of 2 per RFD area), glycol dehydrators (estimated at 1 per well), flaring (assumed to occur in 60% of the wells, with flared gas assumed to be 'sweet'), vehicle exhaust, fugitive dust (from roadways and pads, with construction assumed to represent the critical period). Primary emission components were identified as CO, NO_x, SO_2, PM_{10}, and $PM_{2.5}$.

Calculation of projected average maximum constituent concentrations was completed assuming a well spacing of 40 acres. Average emission rates were utilized for all calculations. Local meteorology or topography were not utilized due to the fact that well placement is not known at this time.

Gas-Fired Compressors, Glycol Dehydrators and Flaring

Based on the assumptions discussed in the preceding section, the development of oil and gas resources as proposed in Alternative A would require approximately 7 compressors and 76 glycol dehydrators. Emissions were calculated using the conditions identified previously, generalized emissions rates for compressors identified in Table 4.6, and an average emission rate of 1.45×10^{-7} g/sec (Trinity and Nicholls 2006) SO_2 from glycol dehydrators. A well spacing of 40 km spacing and consistent operation and emissions over the course of a year was assumed. Projected emissions results for BLM sources are displayed in Table 4.8 for BLM sources under Alternative A.

Table 4.8. Predicted Atmospheric Emissions Concentrations Relative to Federal Standards for Mineral Development on BLM Lands within RFD Areas under All Alternatives

Emission Source/Type	Criteria Values	Projected Concentrations Above or Below NAAQS Criteria or Threshold			
		Alternative A	Alternative B	Alternative C	Alternative D
Gas-Fired Compressors					
Carbon Monoxide (CO)	40,000 µg/m³ (1 hour), 10,000 µg/m³ (8 hour)	Below	Below	Below	Below
Oxides of Nitrogen (NO_x)	100 µg/m³ (annual) as NO_2	Below	Below	Below	Below
Sulfur Dioxide (SO_2)	1,300 µg/m³ (3 hour), 365 µg/m³ (24 hour), 80 µg/m³ (annual)	Below	Below	Below	Below
PM_{10} emissions	150 µg/m³ (24 hour), 50 µg/m³ (annual)	Below	Below	Below	Below
PM_{25} emissions	35 µg/m³ (24 hour), 15 µg/m³ (annual)	Below	Below	Below	Below
Glycol Dehydrators					
Hydrogen Sulfide (H_2S)	1,300 µg/m³ (3 hour), 365 µg/m³ (24 hour), 80 µg/m³ (annual)	Below	Below	Below	Below
Flaring					
Carbon Monoxide (CO)	40,000 µg/m³ (1 hour), 10,000 µg/m³ (8 hour)	Below	Below	Below	Below
Oxides of Nitrogen (NOx)	100 µg/m³ (annual) as NO_2	Below	Below	Below	Below
Vehicle Exhaust					
Carbon Monoxide (CO)	40,000 µg/m³ (1 hour), 10,000 µg/m³ (8 hour)	Below	Below	Below	Below
Oxides of Nitrogen (NOx)	100 µg/m³ (annual) as NO_2	Below	Below	Below	Below
PM_{10} emissions	150 µg/m³ (24 hour)	Below	Below	Below	Below
PM_{25} emissions	35 µg/m³ (24 hour)	Below	Below	Below	Below
Fugitive Dust (Construction Period)					
PM_{10} emissions	150 µg/m³ (24 hour)	Below	Below	Below	Below
PM_{25} emissions	35 µg/m³ (24 hour)	Below	Below	Below	Below

Table 4.8. Predicted Atmospheric Emissions Concentrations Relative to Federal Standards for Mineral Development on BLM Lands within RFD Areas under All Alternatives

Emission Source/Type	Criteria Values	Projected Concentrations Above or Below NAAQS Criteria or Threshold			
		Alternative A	Alternative B	Alternative C	Alternative D
Cumulative Assessment of Projected Emissions					
Carbon Monoxide (CO)	40,000 µg/m³ (1 hour), 10,000 µg/m³ (8 hour)	Below	Below	Below	Below
Oxides of Nitrogen (NO_x)	100 µg/m³ (annual) as NO_2	Below	Below	Below	Below
Sulfur Dioxide (SO_2)	1,300 µg/m³ (3 hour), 365 µg/m³ (24 hour), 80 µg/m³ (annual)	Below	Below	Below	Below
PM_{10} emissions	150 µg/m³ (24 hour), 50 µg/m³ (annual)	Below	Below	Below	Below
PM_{25} emissions	35 µg/m³ (24 hour), 15 µg/m³ (annual)	Below	Below	Below	Below

Vehicle Exhaust

Vehicle exhaust generated by construction equipment and vehicles contains hydrocarbons, combustion byproducts, and particulate emissions.

A six-month construction season was assumed for calculation of conservative annual concentrations and the vehicle type and size assumptions discussed previously were applied. A total of 10 construction vehicles operating on-site at any one time were assumed. Particulate matter smaller than 2.5 microns ($PM_{2.5}$) was assumed to represent 97% of the particulate matter in exhaust and crankcase emissions, and it was also assumed that this relationship applied to the calculated emissions loading. $PM_{2.5}$ thresholds were used to evaluate estimated particulate concentrations.

The equation used to calculate emissions for a pollutant (including NAAQS constituents: particulates, carbon monoxide [CO] and nitrogen dioxide [NO_2]) employed standardized emission factors based on vehicle age and engine size. The equation also accounted for engine load, equipment population, hours of use, and activity level (EPA 2003f, EPA 2006).

An emission factor is defined by the EPA as the average emissions of a pollutant from a specific equipment category type and is usually expressed in grams per horsepower-hour (g/hp-hr). Equipment population was the number of pieces of equipment estimated to be in use for project work at any one time. Hours of use were assumed to be full time over the 12-hour daily work period, seven days per week. This is, of course, an overestimation of emissions for the majority of construction activity, but it would be representative of periods of intense activity and, therefore, serves as a conservative estimate of critical conditions (EPA 2003f, EPA 2006).

If older equipment (pre-1997) is used for the project work, it should be understood that emissions could be as much as two times higher than those calculated for this assessment (EPA 2003f, EPA 2006). However, it is unlikely that the entire population of equipment used would be older than 1997. The conservative assumptions made for hours of use, total equipment population, and wind conditions are expected to sufficiently protect air quality from project-related exhaust emissions.

Projected emissions results are displayed in Table 4.8 for BLM sources under Alternative A.

Fugitive Dust (Construction Period)

Soils in the MPA have been characterized as having low to moderate wind-erodibility. For Alternative A (all RFD areas) approximately 56% of the soils were projected to have low wind-erodibility, 37% were projected to have moderate wind-erodibility, and 7% of the soils were projected to have high wind-erodibility (derived from SSURGO-certified soil data). The remaining soils had no associated wind-erodibility data.

As construction at all proposed wells is not likely to be undertaken simultaneously, it was assumed that total soil disturbance within each RFD area at any given time would not exceed an area of disturbance greater than 15 acres (the total disturbance area associated with a single well site). Vehicle number, type, size, and speed of travel; soil moisture and silt content; wind speed

and dispersion height; and soil stabilization procedures and effectiveness assumptions discussed previously (which represent periods of intense construction activity) were used in this analysis.

Projected emissions results are displayed in Table 4.8 for BLM sources under Alternative A.

This analysis used the methodology and assumptions outlined previously, and assumed that watering of all exposed disturbance areas (e.g., work areas, staging areas, and roads) on the construction site would occur with adequate frequency to keep soils moist during working hours. With this additional dust abatement mechanism in place, the average maximum potential PM_{10} and $PM_{2.5}$ emissions from construction activities and the operation of construction equipment and vehicles were estimated to decrease by 50%.

In addition to construction-specific actions under Alternative A, some additional post-construction particulate (dust) emissions are projected to occur on a short-term basis due to loss of vegetation within the construction and staging areas. Given appropriate soil stabilization and revegetation measures, these emissions are projected to be minimal to negligible.

Cumulative Assessment of Projected Emissions

Background CO, NO_x, and SO_2 concentration information was not available within the MPA. Background concentrations available for each constituent displayed in Table 3.2, Ambient Air Quality Data for the MPA, represented the best available data and were used for comparison purposes. The measured concentrations most likely represent an overestimate of background concentrations in the MPA as the areas where measured data were available are more densely populated than the MPA and have the potential for a greater number of emission sources.

Background PM_{10} and $PM_{2.5}$ concentration data were available from Moab and Grand Junction, Colorado as displayed in Table 3.2, Ambient Air Quality Data for the MPA.

Cumulative projected BLM project-related emission concentrations were combined with the background concentrations, to estimate cumulative impacts. Projected emissions results are displayed in Table 4.8 for BLM sources under Alternative A.

Assuming appropriate application of control measures, no appreciable, long-term, adverse air-quality impacts are projected for oil and gas development under this alternative.

4.3.1.2.3 ALTERNATIVE B

4.3.1.2.3.1 Impacts of Recreation and Travel Management Decisions on Air Quality

Under Alternative B, recreation management decisions would result in additional constraints to motorized vehicle use as compared to Alternative A.

Impacts of recreation management decisions under Alternative B are expected to be similar in nature, but more widespread than those described for Alternative A

In general, Alternative B allows no cross country driving, and is the most restrictive concerning surface disturbing activities, and therefore has the highest potential for associated incremental benefit to air quality of all the proposed alternatives because cross country travel would be eliminated.

4.3.1.2.3.2 Impacts of Mineral Development Decisions on Air Quality

Based on the proportion of BLM lands open for leasing and the RFD (BLM 2005f), it is estimated that 255 oil and gas wells would be drilled over the life of the RMP (Table 4.9), a decrease of approximately 43% from Alternative A. Surface disturbance associated with these wells is estimated to involve approximately 3,823 acres over the life of the RMP (a decrease of approximately 43% from Alternative A). Oil and gas development is anticipated to occur in all RFD areas but is projected to be least likely to occur in the Roan Cliffs RFD Area, while the Book Cliffs and Greater Cisco RFD Areas are projected to experience the greatest amount of development, similar to Alternative A. Additional information on disturbance specific to salable resources, other leasable resources, and geophysical exploration is available in Section 4.3.7.3.2.1 Impacts of Mineral Resource Development Decisions on Mineral Resource Development.

Total acreages in each leasing category and the calculated number of wells for Alternative B are listed in Table 4.9.

Table 4.9. Average Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative B over 15 Years

RFD Area	Average Predicted Oil and Gas Wells[1]	Estimated Compressors Necessary[2]	Estimated Glycol Dehydrators Necessary[2]
Book Cliffs	66	4	64
Greater Cisco Area	92	5	85
Roan Cliffs	1	2	1
Salt Wash	11	2	11
Big Flat – Hatch Point	19	2	19
Lisbon Valley	54	3	54
Eastern Paradox	21	2	21
Total	**264**	**17**	**264**

Note: Calculations based on BLM lands only, and are specific to the life of the RMP (15 years).

[1] The number of oil and natural gas wells was calculated as a cumulative total, not independently. For the purpose of analyzing impacts of minerals decisions on the total number of oil and natural gas wells, BLM lands designated as No Surface Occupancy (NSO) were not considered open for development.

[2] Necessary compressors were calculated at 0.063 per well (minimum of 2 per RFD area). Necessary glycol dehydrators were calculated at 1 per well (Trinity and Nicholls 2006).

Projected emissions results are displayed in Table 4.8 for BLM sources under Alternative B.

Assuming appropriate application of control measures, no appreciable, long-term, adverse air-quality impacts are projected for oil and gas development under this alternative.

4.3.1.2.4 ALTERNATIVE C

4.3.1.2.4.1 Impacts of Recreation and Travel Management Decisions on Air Quality

Under Alternative C, recreation management decisions would result in minor additional constraints to motorized vehicle use as compared to Alternative A.

Impacts of recreation management decisions under Alternative C are expected to be similar in nature but more widespread than those described for Alternative A, and less widespread than those described for Alternative B

In general Alternative C is less restrictive of surface disturbing activities, including cross country driving, than Alternative B, and more restrictive than Alternatives D or A, with the potential for a moderate associated incremental benefit to air quality, because cross country travel would be allowed only on 1,866 acres.

4.3.1.2.4.2 Impacts of Mineral Development Decisions on Air Quality

Based on the proportion of BLM lands open for leasing and the RFD (BLM 2005f), it is estimated that 432 oil and gas wells would be drilled over the life of the RMP (Table 4.10), a decrease of approximately 4% from Alternative A. Surface disturbance associated with these wells is estimated to involve approximately 6,483 acres over the life of the RMP (a decrease of approximately 4% from Alternative A). Oil and gas development is anticipated to occur in all RFD areas but is projected to be least likely to occur in the Roan Cliffs RFD Area, while the Book Cliffs and Greater Cisco RFD Areas are projected to experience the greatest amount of development, similar to Alternative A Additional information on disturbance specific to salable resources, other leasable resources, and geophysical exploration is available in Section 4.3.7.3.2, Impacts of Mineral Resource Development Decisions on Mineral Resource Development.

Total acreages in each leasing category and the calculated number of wells for Alternative C are listed in Table 4.10.

The assumptions and methodologies employed to estimate project-related emissions for Alternative A were applied for estimation of project-related emissions for Alternative C. Projected emissions results for BLM sources are displayed in Table 4.8 for BLM sources under Alternative C.

Assuming appropriate application of control measures, no appreciable, long-term, adverse air-quality impacts are projected for oil and gas development under this alternative.

Table 4.10. Average Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative C over 15 Years

RFD Area	Average Predicted Oil and Gas Wells[1]	Estimated Compressors Necessary[2]	Estimated Glycol Dehydrators Necessary[2]
Book Cliffs	104	7	104
Greater Cisco Area	197	12	197
Roan Cliffs	2	2	2
Salt Wash	11	2	11
Big Flat – Hatch Point	34	2	34
Lisbon Valley	56	4	56
Eastern Paradox	28	2	28
Total	**432**	**31**	**432**

Note: Calculations based on BLM lands only, and are specific to the life of the RMP (15 years).

[1] The number of oil and natural gas wells was calculated as a cumulative total, not independently. For the purpose of analyzing impacts of minerals decisions on the total number of oil and natural gas wells, BLM lands designated as No Surface Occupancy (NSO) were not considered open for development.

[2] Necessary compressors were calculated at 0.063 per well (minimum of 2 per RFD area). Necessary glycol dehydrators were calculated at 1 per well (Trinity and Nicholls 2006).

4.3.1.2.5 ALTERNATIVE D

4.3.1.2.5.1 Impacts of Recreation and Travel Management Decisions on Air Quality

Under Alternative D, recreation management decisions would result in minor additional constraints to motorized vehicle use as compared to Alternative A.

Impacts of recreation management decisions under Alternative D are expected to be similar in nature and area of influence to those described for Alternative C.

In general Alternative D is less restrictive of surface disturbing activities, including cross country driving, than Alternatives B or C, and more restrictive than Alternative A, with the potential for a moderate associated incremental benefit to air quality.

4.3.1.2.5.2 Impacts of Mineral Development Decisions on Air Quality

Based on the proportion of BLM lands open for leasing and the RFD (BLM 2005f), it is estimated that 448 oil and gas wells would be drilled over the life of the RMP (Table 4.11), a decrease of approximately 0.7% from Alternative A. Surface disturbance associated with these wells is estimated to involve approximately 6,739 acres over the life of the RMP (a decrease of approximately 0.5% from Alternative A). Oil and gas development is anticipated to occur in all RFD areas but is projected to be least likely to occur in the Roan Cliffs RFD Area, while the Book Cliffs and Greater Cisco RFD Areas are projected to experience the greatest amount of development, similar to Alternative A. Additional information on disturbance specific to salable

resources, other leasable resources, and geophysical exploration is available in Section 4.3.7.3.2.1, Impacts of Mineral Resource Development Decisions on Mineral Resource Development.

Total acreages in each leasing category and the calculated number of wells for Alternative D are listed in Table 4.11.

Table 4.11. Average Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative D over 15 Years

RFD Area	Average Predicted Oil and Gas Wells[1]	Estimated Compressors Necessary[2]	Estimated Glycol Dehydrators Necessary[2]
Book Cliffs	105	7	105
Greater Cisco Area	197	12	197
Roan Cliffs	2	2	2
Salt Wash	12	2	12
Big Flat – Hatch Point	44	3	44
Lisbon Valley	56	4	56
Eastern Paradox	32	2	32
Total	**448**	**32**	**448**

Note: Calculations based on BLM lands only, and assume a 15 year time period.

[1] The number of oil and natural gas wells was calculated as a cumulative total, not independently. For the purpose of analyzing impacts of minerals decisions on the total number of oil and natural gas wells, BLM lands designated as No Surface Occupancy (NSO) were not considered open for development.

[2] Necessary compressors were calculated at 0.063 per well (minimum of 2 per RFD area). Necessary glycol dehydrators were calculated at 1 per well (Trinity and Nicholls 2006).

Projected emissions results for BLM sources are displayed in Table 4.8 for BLM sources under Alternative D.

Assuming appropriate application of control measures, no appreciable, long-term, adverse air-quality impacts are projected for oil and gas development under this alternative.

4.3.1.3 Summary of Impacts

Management decisions have the potential to impact air quality to the following degrees:

Recreation and mineral management (oil and gas development) decisions would emit pollutants during operation (i.e., vehicle emissions, well operations, compressor engines, etc.), along with fugitive dust from public vehicle use, OHVs, construction and mineral development activities. Air quality impacts from the projected levels of emission are expected to be minimal to negligible.

Impacts to air quality from prescribed fire management decisions would generally be related to particulate matter (primarily $PM_{2.5}$) and carbon dioxide (CO_2). Impacts would generally be short term and would result in long-term benefits for other resources.

4.3.2 Cultural Resources

This section presents the impacts to cultural resources from management actions discussed in Chapter 2. Existing conditions concerning cultural resources are described in Chapter 3.

Impacts to the cultural resources of the MPA could primarily result from activities associated with surface and subsurface disturbance such as development projects, recreational use/OHV travel, and fire management. However, impacts may also result from specific cultural resource management decisions and from non-surface-disturbing activities that create visual and/or auditory effects. These latter impacts would apply primarily to sites or locations deemed sacred or traditionally important by Native American tribes and used by these groups in such a manner that visual obstructions and/or noise levels impinge upon that use. Impacts to cultural resources may be indirect, negligible, or non-existent from decisions related to some resource programs. In particular, management decisions for air quality, health and safety, soils and watershed, wildlife, and special status species are expected to have little or no direct or indirect effect on cultural resources within the MPA. Those actions, determined by the BLM IDT through best professional judgement as having little or no potential for impacts on cultural resources, will not be considered further in this analysis. All other management decisions with the potential to impact cultural resources either beneficial or adverse are discussed in subsequent sections of this chapter. Impacts to cultural resources from program decisions are considered to be long-term for the purpose of this analysis.

Because the majority of cultural resources that have been identified in the MPA consist of archaeological sites, the primary concern for impacts relates to disturbance of the artifacts, features, and architecture of sites in ways that reduce their integrity, alter their association with traditional values, and reduce the potential to recover data. Archaeological data consist of both "objects"(in the broad sense of artifacts, architecture, features, etc.), and the horizontal and vertical relationships between these objects. Our ability to interpret and understand the past is based on recovering not only the material culture of the past in the form of artifacts, buildings, and the built environment, but the spatial relationships between different aspects of material culture. Consequently, surface and subsurface disturbances have the greatest potential for adverse impacts on cultural resources. Impacts can include elimination or reduction of the setting and physical integrity of a sacred or other site, including National Register-eligible sites, landscapes, and cultural theme areas. Other impacts may include disruption or reduction of the religious values of sites and areas, reduction in the data potential of a site, and damage to traditional collection areas or resource sites. In general, impacts on cultural resources from surface disturbance are long-term and permanent; once an archaeological site has been impacted, the effect typically cannot be reversed. However, as stated previously, short-term effects from visual or auditory impacts may occur, and can often be mitigated or accommodated.

Potential impacts to specific cultural resources from the various proposed management alternatives are difficult to quantify precisely. The management alternatives neither stipulate

precise areas for surface-disturbing activities, nor are the precise locations of all cultural resources in the area known. However, it is possible to estimate impacts based on the proposed general locations of activities and the relationships of these planning areas to zones of high or low probability of containing cultural resources.

4.3.2.1 ANALYSIS CONSIDERATIONS

A model of cultural resource site density was developed as a means of estimating the general densities of sites at a landscape level. This model was developed by the MFO staff using environmental variables that are known to coincide with land use actions. The following variables were used to predict the occurrence of cultural sites in the MFO:

- Lands within 0.5 mile of a spring
- Lands within 1 mile of a river or major drainage
- Lands within 0.5 mile of intermittent streams
- Lands within 300 meters of a riparian area
- Lands classified as Pinyon-Juniper from Southwest Regional Gap Analysis Project (SWREGAP) data
- Lands classified as sand dunes using SWREGAP data
- Lands within the following geologic types: Summerville Formation, Entrada sandstone, Morrison Formation, Navajo Sandstone, Alluvial and Aeolian deposits, Cedar Mountain Formation, and Wingate sandstone

If only one of the above variables was present within a given area of the MPA, the area was classified as low probability for archeological sites. If two variables were present, the area was classified as medium probability for archeological sites. If an area had three or more variables, it was classified as high probability for archeological sites. To test the model, the MFO took all known (4,259) sites in the field office area and intersected them with the probability coverage. The assumption was made that if a point intersected with a medium or high probability polygon, it was a correct classification; if the point intersected a low polygon, it was an incorrect classification. Using a 15-meter buffer, the model correctly classified sites to 73% accuracy. That is, 3,103 of the 4,259 sites fell within the high or medium probability polygons.

While the site density prediction model used in this analysis is by no means a perfect predictor of site density, it is sufficiently accurate (73% success rate) to be utilized as a tool for analyzing potential relative involvement of cultural resource sites in management decisions. It is therefore used in analyses in the RMP as a means of gauging whether a particular alternative would involve more acres of high or medium site density land than another. The model is not used to predict numbers of sites involved in decisions, nor should it be considered a replacement for full inventory for sites prior to surface disturbance or as a substitute for the Section 106 process of the National Historic Preservation Act.

Impacts of many of the proposed management actions are assessed in the following sections with regard to how much of the action is likely to result in surface-disturbing activities within the high or medium density zones. For the purpose of analysis, it is assumed that the potential for

disturbance in high and medium site density areas is proportional to the total acres of land in each site density category within the area where the disturbance would take place. For example, assume that a particular area contains 100 acres, 20 acres (20%) of which are classified by the site density model as having high site density and 80 acres (80%) of which are classified as having low site density. Assume also that a particular management decision is expected to result in a total of 50 acres of disturbance within the 100-acre area. For the purpose of the analysis of impacts to cultural resources described in this document, it would be assumed that 10 acres (20%) of that disturbance would be located in the high site density area, and 40 acres (80%) of the disturbance would be located in the low site density area. Again, while not precise, this method enables a quantifiable assessment of probable relative effect(s) of planning action alternatives.

4.3.2.2 Impacts Common to All Alternatives

Certain management decisions for cultural resources would apply to all alternatives and would impact such resources equally regardless of the alternative. Table 4.12 summarizes the anticipated impacts to cultural resources that may be anticipated under all alternatives.

Table 4.12. Impacts Common to All Alternatives

Resource Program	Impact on Cultural Resources
Cultural Resources	Compliance with all existing statutes, regulations, formal agreements, Executive Orders, and policies applicable to cultural resources, including the NHPA, NAGPRA, and existing treaties and trust agreements, would reduce opportunities for short- and long-term, adverse impacts to cultural resources. Application of avoidance measures as part of compliance with Federal laws such as the NHPA would provide for long-term beneficial impacts to cultural resource sites.
Fire Management	Protection of cultural resources was a key factor in determining fuels treatment and fire response actions included in the Moab Fire Management Plan (Moab FMP). As such, fire management in the MPA already includes measures to limit overall impacts on cultural resources. A total of 15,500 acres would be treated through prescribed fire every 10 years. Approximately 5,860 acres of those treatments would occur in high cultural resource site density areas, and 6,217 acres would occur in the medium site density areas. An additional 7,450 acres would be treated through non-fire treatments, with approximately 1,347 acres of those treatments occurring in high site density areas and 3,063 acres occurring in medium site density areas. BLM fire management policy is to conduct cultural resource identification surveys prior to treatment for fuels reduction through non-fire treatments or prescribed fire. As such, the actual risk to cultural resources within the MPA from fire management decisions is considered low. Up to 40,000 acres every 10 years would be treated through use of wildland fire. Of this area, approximately 6,360 acres would be in high site density areas and 20,700 acres would be in medium site density areas.
Lands and Realty	WSAs and WAs would be exclusion zones for rights-of-way, which would afford a certain level of long-term benefit to cultural resources from reductions in ground disturbance and less human activity in the vicinity of sites. Continuation of mineral withdrawals for 78,333 acres of

Table 4.12. Impacts Common to All Alternatives

Resource Program	Impact on Cultural Resources
	land would eliminate one source of potential ground disturbance and related secondary impacts to cultural resources over the short and long terms.
Livestock Grazing	Grazing would not be authorized on approximately 48,220 acres on several allotments in the MPA. Cultural resource sites within these allotments, regardless of site density, would experience long-term beneficial impacts as a result of reduced opportunities for trampling by livestock.
Minerals	Approximately 353,510 acres within WSAs and Wilderness Areas would be closed to mineral leasing and development. Cultural resources within these closed areas would experience long-term beneficial impacts from reduced opportunities for both direct and indirect impacts resulting from surface disturbance and increased human presence that accompany mineral development. Outside of closed areas, application of BLM's standard policies and adherence with Federal cultural resource legislation as part of authorizing or permitting use of minerals resources includes measures for identifying cultural resources prior to development and avoidance, minimization, and/or mitigation measures to reduce potential adverse impacts to cultural resources. However, areas open to mineral development do pose some indirect, yet unquantifiable risk to cultural resources. An estimated 173 acres of high site density lands and 345 acres of medium site density lands within the MPA would be subject to potential surface disturbance over the life of the RMP for development of non-oil and gas leasable minerals, and locatable minerals. BLM would implement the Section 106 process for all mineral development, thereby providing opportunity to avoid, minimize, or mitigate potential direct adverse impacts to cultural resources. Indirect adverse impacts to cultural resources would likely still occur from increased human activity associated with minerals development on MPA lands, which often leads to inadvertent impacts, vandalism, and looting. Mineral withdrawals would apply to 41,488 acres of high site density lands and 26,298 acres of medium site density lands.
Non-WSA Lands with Wilderness Characteristics	There are no actions common to all alternatives for wilderness characteristics. This would result in greater adverse impacts to cultural resources due to an increase in surface disturbing activities on these non-WSA lands.
Paleontological Resources	Paleontological program decisions have the potential for minimal, indirect impacts, both adverse and beneficial, on cultural resources. Cultural resources could indirectly benefit from pre-development paleontological surveys in that such resources could be identified as a result of fossil surveys and avoided during development. Cultural resources could experience adverse impacts as an indirect result of existing permissions to collect certain types of fossil materials from BLM lands within the MPA. Casual collectors may not distinguish between paleontological materials and cultural resources or may not recognize that permissions to collect fossil materials do not also extend to cultural artifacts.

Table 4.12. Impacts Common to All Alternatives

Resource Program	Impact on Cultural Resources
Recreation	Management of recreation stresses maintenance of rangeland health, which provides limited short- and long-term benefits to cultural resources through measures reducing ground disturbance and natural resource degradation. However, without additional measures focused on cultural resources, long-term adverse impacts may occur.
Special Designations	A total of 71,460 acres in WSAs are located on lands classified as having high cultural resource site density. Another 172,334 acres are located on lands classified as having medium cultural resource site density. The same acres would be included in WSAs for all alternatives. Management of WSAs under the IMP includes restrictions on surface disturbance. These restrictions limit surface disturbance for new actions (valid existing rights and other pre-existing authorizations are recognized) to a level of disturbance that does not impair the wilderness suitability of the WSA in question. Because of these restrictions on surface-disturbing activities, cultural resources within these areas of special designation would experience long-term indirect beneficial impacts through reduced opportunities for inadvertent disturbance. There are no actions Common to All Alternatives concerning ACECs or WSRs.
Visual Resources	Designation of WSAs and designated wilderness as VRM Class I would reduce opportunities for direct and indirect adverse impacts to cultural resources within those areas because surface disturbing activities are excluded, thereby resulting in potential long-term, beneficial impacts to these resources.
Woodlands	Woodland harvest would result in long-term beneficial impacts on traditional cultural practices of Native Americans, and potential long-term beneficial impacts to cultural resources from reductions in fuels loading and a resulting reduction in the probability of catastrophic wildfire, which can severely damage certain types of cultural resources. Woodland harvest could have potential inadvertent indirect impacts to cultural resources from the cross country driving and surface disturbance associated with woodcutting activities.

* high and medium site density land figures were derived from RFD impact tables with the assumption that the distribution of potential impact over the high and medium site density areas would be comparable to the ratio of high to medium density area within the combined WSAs and Was

4.3.2.3 Impacts Common to All Action Alternatives (B, C and D)

Certain management decisions within this EIS are common to only the action alternatives (Alternatives B, C, and D) and not to Alternative A. These decisions have the potential to result in impacts to cultural resources within the MPA. Table 4.13 summarizes the potential impacts to cultural resources that could occur from these common actions under Alternatives B, C, and D. Fire management decisions apply to all alternatives, including Alternative A, and are discussed in Section 4.3.2.2.

Table 4.13. Impacts Common to All Action Alternatives

Resource Program	Impact on Cultural Resources
Cultural Resources	Cultural resources would experience long-term, beneficial impacts from reduced opportunities for direct and indirect disturbance associated with recreational activities, improper livestock grazing, and OHV use. Specific provisions would be implemented to minimize or mitigate ongoing conflicts between cultural resources and other authorized land uses. A focus on proactive site inventory would expand the BLM's knowledge of the cultural resources under its jurisdiction and help the agency to refine management strategies. The identification of cultural resource sensitive areas would reduce opportunities for adverse impacts to cultural resources in those areas. The development of CRMPs for seven culturally sensitive areas would better integrate the management of cultural resources in these areas with management of other resources and land uses, which should benefit cultural resources.
Lands and Realty	Elimination of the utility corridor from Cisco to US 191 would reduce the potential adverse impacts on cultural resources in and adjacent to that corridor by eliminating surface disturbance.
Livestock Grazing	Identification and implementation of appropriate utilization levels would help reduce grazing intensity and the attendant erosion, which can directly and indirectly adversely impact cultural resources.
Minerals	The application of NSO stipulations for the protection of natural resource values and recreational opportunities in the Three Rivers and Westwater Mineral Withdrawal areas would indirectly benefit cultural resources in these areas by reducing potential sources of ground disturbance and human activity. Applications of NSO stipulations in the Moab and Spanish Valleys, Castle Valley (including Mayberry Orchard), Thompson Springs, Moab Landfill, Moab Airport and Dead Horse Point State Park would provide long-term indirect benefits to cultural resources for the same reason.
Paleontological Resources	Impacts would be effectively the same as described for all alternatives (Table 4.1).
Recreation	Management of recreational activity to sustain other resource values, including cultural resources, would provide long-term benefit to cultural resources by curtailing activities that have direct and indirect adverse impacts on these resources. Allowance of dispersed camping throughout much of the MPA places cultural resources in those areas at risk for long-term adverse impacts from direct disturbance, vandalism, and looting. More concerted development and promotion of recreational trails provides opportunities to educate the public about cultural resource preservation, thereby benefiting these resources. Development of SRMAs would have similar potential for beneficial impacts as described for recreational trails.
Travel Management	OHV use would be restricted to designated routes, resulting in variable beneficial impacts to cultural resources.
Woodlands	Restrictions on fuelwood gathering in riparian areas would reduce opportunities for adverse impacts to cultural resources. Closure of areas to wood gathering and wood harvest when unacceptable impacts to sensitive resources are identified would help minimize adverse impacts to cultural resources, though mitigation of adverse impacts for previously impacted cultural sites may be necessary.

4.3.2.4 ALTERNATIVES IMPACTS

Proposed management decisions for many resource programs within the MPA vary by alternative. The potential impacts of these varying decisions are discussed in the following sections by alternative.

4.3.2.4.1 ALTERNATIVE A

Impacts to cultural resources under Alternative B incorporate all of the impacts discussed in Section 4.3.2.2, Impacts Common to All Alternatives. Additional impacts to cultural resources under Alternative B, excluding special designations, are described in Table 4.14. Because special designations incorporate an array of individualized management actions, the impact of their associated decisions on cultural resources is discussed separately, following Table 4.14. There are no alternative-specific management actions for fire or paleontological resources.

Table 4.14. Impacts to Cultural Resources Under Alternative A

Resource Program	Impact on Cultural Resources
Cultural Resources	Current levels of beneficial and adverse impacts to cultural resources from authorized land uses would continue. All sites would be allocated to scientific use.
Lands and Realty	Designated utility corridors would encompass 3,776 acres of high site density lands and 7,930 acres of medium site density lands. This represents approximately 1.2% each of all high and medium site density lands in the MPA.
Livestock Grazing	Grazing would not be available on 126,907 acres of land (which is less than Alternative B, but more than Alternatives C or D). Grazing would not be available on 8% (24,329 acres) of high site density lands and 9% (55,395 acres) of medium site density lands within the MPA. Grazing would be allowed on 278,247 acres (92%) of high site density lands and 569,771 acres (92%) of medium site density lands. Cultural resources in areas available for grazing could experience minimal long-term adverse impacts from trampling and rubbing (e.g., on rock art panels) by livestock. All eligible sites would be mitigated. Cultural resources in areas not available for grazing would experience long-term benefits from reduced opportunities for direct and indirect impacts.
Minerals—oil and gas—Book Cliffs RFD	Approximately 79 acres of ground disturbance involving soil movement in high site density areas and 645 acres in medium site density areas would occur over the life of the RMP. This represents approximately 0.4% of all high site density lands and 0.6% of all medium site density lands in the RFD area. Standard BLM policy and the Section 106 process would be applied to all applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance. Inadvertent impacts and impacts from vandalism and looting that may accompany increased human activity in developed areas may occur.
Minerals—oil and gas—Greater Cisco RFD	Approximately 110 acres of disturbance in high site density areas and 490 acres in medium site density areas would occur over the life of the RMP. This represents approximately 0.8% of all high site density lands and 1% of all medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.

Table 4.14. Impacts to Cultural Resources Under Alternative A

Resource Program	Impact on Cultural Resources
Minerals—oil and gas—Roan Cliffs RFD	Approximately 3 acres of disturbance in high site density areas and 14 acres in medium site density areas would occur over the life of the RMP. This represents approximately 0.01% of all high site density lands and 0.03% of all medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Salt Wash RFD	Approximately 17 acres of disturbance in high site density areas and 52 acres in medium site density areas would occur over the life of the RMP. This represents approximately 0.3% of all high site density lands and 0.3% of all medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Big Flat-Hatch Point RFD	Approximately 151 acres of disturbance in high site density areas and 203 acres in medium site density areas would occur over the life of the RMP. This represents approximately 0.2% of all high site density lands and 0.2% of all medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Lisbon Valley RFD	Approximately 174 acres of disturbance in high site density areas and 361 acres in medium site density areas would occur over the life of the RMP. This represents approximately 0.7% of all high site density lands and 0.7% of all medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Eastern Paradox RFD	Approximately 84 acres of disturbance in high site density areas and 163 acres in medium site density areas would occur over the life of the RMP. This represents approximately 0.07% of all high site density lands and 0.07% of all medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—geophysical	An estimated 407 acres (0.1%) of land in high site density areas within the MPA and 815 acres (0.1%) of medium site density lands would be subject to disturbance for geophysical work over the life of the RMP. Cultural resources in these areas would be available for long-term adverse impacts. Adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts occurring as a result of geophysical activities.
Minerals—salable (mineral materials)	A total of 1,467,768 acres is available for the disposal of salable minerals. Although adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts, the greater the area available for salable minerals disposal, the greater potential for adverse impacts because of possible inadvertent impacts.
Non-WSA Lands with Wilderness Characteristics	There are no specific management actions related to non-WSA lands with wilderness characteristics under Alternative A.
Recreation	Approximately 49,543 acres of high site density lands and 37,418 acres of medium site density land would be managed within SRMAs. This represents approximately 16% of all high site density lands and 6% of all medium site density lands in the MPA. The management and education of recreationists would generally have long-term beneficial impacts on cultural resources as direct and indirect disturbance of sites would be less likely occur either intentionally (e.g., vandalism and looting) or inadvertently. Careful

Table 4.14. Impacts to Cultural Resources Under Alternative A

Resource Program	Impact on Cultural Resources
	monitoring by the BLM of site condition in these areas would help identify unacceptable impacts early on and allow for implementation of minimization and/or mitigation measures to address these impacts.
Special Designations	Although none of the eligible WSRs would be determined and managed as suitable for congressional wild and scenic designation in this alternative, they would all remain eligible and would continue to be managed to protect their outstandingly remarkable values, tentative classifications, and free-flowing nature on a case-by-case basis. This would provide a temporary benefit to cultural resources by reducing potential for direct and indirect impacts to site."
Travel Management	Approximately 1,049 acres (0.3%) of high site density lands and 1,844 acres (0.3%) of medium site density lands would be closed to OHV use. Approximately 208,757 acres (69%) of high site density lands and 386,579 acres (62%) of medium site density lands would be in areas where OHV use is limited to designated routes, and 92,628 acres (31%) of high site density lands and 236,593 acres (38%) of medium site density lands open to cross country OHV use. Cultural resources in areas closed to OHV use would experience long-term reductions in risks of direct and indirect adverse impacts. Cultural resources located in areas limited to OHV use on designated routes would experience variable beneficial and adverse impacts in that cultural resources in areas located off of designated routes would experience lower levels of disturbance, but cultural resources located adjacent to designated routes would likely experience more concentrated disturbance. Cultural resources located in areas open to cross country OHV use would experience current, or potentially increased, levels of adverse impacts from direct and indirect disturbances. Alternative A would have more high and medium site density lands open to cross country OHV use and less closed to OHV use than any other alternative. Existing travel routes would remain open and available for use under current conditions. Existing levels of direct and indirect impacts, primarily adverse, to cultural resources would continue to result from inadvertent and induced impacts associated with human activity in areas containing sites.
Visual Resources	Designation of 72,609 acres (24%) of high site density lands and 174,085 acres (28%) of medium site density lands as VRM Class I conditions would benefit cultural resources in those areas by limiting surface-disturbing activities and the associated human activity.
Woodlands	Woodland products use would be prohibited on 144,146 acres (47%) of high site density lands and 252,959 acres (40%) of medium site density lands within the MPA. Use of woodland products would be allowed on 158,768 acres (53%) of high site density lands and 372,944 acres (60%) of medium site density lands. Cultural resources in areas open to woodland products use could experience long-term adverse impacts from direct disturbance (e.g., being driven over or subject to other surface disturbance such as mixing of soils containing artifacts in work areas and loading sites) or indirect disturbance (e.g., vandalism and looting). It is important to note that not all areas open to woodland products use contain actual woodlands that would be targeted for use; therefore, the actual acres of high / medium site density lands on where wood gathering or harvest would occur is expected to be much less than the sum total of lands open for such activities.

Special designations management decisions under Alternative A would have both direct and indirect long-term impacts on cultural resources within the MPA. Special designations include WSAs, ACECs, and WSRs. The impact to cultural resources of management actions under WSAs were discussed under Impacts Common to All Alternatives.

The Negro Bill ONA is largely within a WSA and the restrictions associated with WSA were discussed in Impacts Common to All Alternatives. No WSRs would be established under this alternative. Portions of the ONA that would be managed under WSA special designations under Alternative A include approximately 243 acres of lands with high cultural resource site density. This area would be managed with restrictions on surface disturbance to protect non-motorized recreational (i.e., hiking) opportunities and outstanding natural resources. These restrictions would provide long-term benefit to cultural resources by reducing opportunities for direct and indirect impacts to sites.

Other areas of the MPA to be designated ACECs under the action alternatives to protect relevant and important cultural values would not be designated under Alternative A. These areas would generally be managed to be consistent with the surrounding land management strategy and would, in most cases, allow for surface disturbance that could adversely impact cultural resources.

4.3.2.4.2 Alternative B

Impacts to cultural resources under Alternative B incorporate all of the impacts discussed in Section 4.3.2.2, Impacts Common to All Alternatives. Additional impacts to cultural resources under Alternative B, excluding special designations, are described in Table 4.15. Because special designations incorporate an array of individualized management actions, the impact of these designations on cultural resources is discussed separately, following Table 4.15. There are no alternative-specific management actions for fire or paleontological resources.

Table 4.15. Impacts to Cultural Resources Under Alternative B

Resource Program	Impact on Cultural Resources
Cultural Resources	Priority for new inventory and assessment would encompass 50,000 acres, resulting in refined knowledge of cultural resources within the MPA and a better ability to manage these resources effectively. More sites would be targeted for restoration and nomination to the NRHP under this alternative than under any other alternative, and fewer sites would be allocated or developed for public use. Restoration of damaged sites would result in long-term benefits to the targeted sites. Public interpretation of sites has both short-term and long-term beneficial and adverse impacts to cultural resources through raising awareness of the presence of such resources in the area and educating the public about protection of cultural sites. While education may encourage visitors to be more careful around cultural sites and avoid collecting or moving artifacts, raising the awareness of sites in a given area may lead some visitors to seek out unprotected sites for the purpose of looting.

Table 4.15. Impacts to Cultural Resources Under Alternative B

Resource Program	Impact on Cultural Resources
Lands and Realty	Designation of ACECs as avoidance areas for rights-of-way would provide long-term benefits to cultural resources in these areas by removing one potential source of ground disturbance and related indirect adverse impacts. Designated utility corridors would encompass 6,309 acres (2%) of high site density lands and 17,056 acres (3%) of medium site density lands. Cultural resources within these utility corridors would be vulnerable to adverse impacts from development of the utilities. Application of BLM standard procedures and the Section 106 process would reduce opportunities for such impacts and allow for avoidance, minimization, or mitigation of potential adverse impacts to a large degree.
Livestock Grazing	Grazing would be removed from or restricted in certain known high (sensitive) site density areas and would provide beneficial impacts to cultural resources from reduced opportunities for trampling, rubbing, and erosion from loss of vegetation. More such areas would exist under Alternative B (153,797 acres) than under any other alternative. Grazing would be prohibited on 29,758 acres (10%) of high site density lands and 63,524 acres (10.0%) of medium site density lands within the MPA. Grazing would be allowed on 272,818 acres (90%) of high site density lands and 561,641 acres (90%) of medium site density lands. Cultural resources in areas available for grazing could experience minimal long-term adverse impacts from trampling and rubbing (e.g., on rock art panels) by livestock. All eligible sites would be mitigated. Cultural resources in areas not available for grazing would experience long-term benefits from reduced risk for direct and indirect impacts.
Minerals—oil and gas—Book Cliffs RFD	Approximately 41 acres of disturbance in high site density areas and 438 acres in medium site density areas would occur over the life of the RMP. This represents 0.2% of high site density lands and 0.4% of medium site density lands in the RFD area. Standard BLM policy and the Section 106 process would be applied to all applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance. Inadvertent impacts and impacts from vandalism and looting that may accompany increased human activity in developed areas may occur.
Minerals—oil and gas—Greater Cisco RFD	Approximately 70 acres of disturbance in high site density areas and 253 acres in medium site density areas would occur over the life of the RMP. This represents 0.5% of high site density lands and 0.6% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Roan Cliffs RFD	Approximately 6 acres of disturbance in medium site density areas would occur over the life of the RMP. This represents 0.01% of medium site density lands in the RFD area. No high site density lands would likely be impacted. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Salt Wash RFD	Approximately 23 acres of disturbance in high site density areas and 41 acres in medium site density areas would occur over the life of the RMP. This represents 0.4% of high site density lands and 0.3% of medium site density lands in the RFD area. Impacts would be similar to those

Table 4.15. Impacts to Cultural Resources Under Alternative B

Resource Program	Impact on Cultural Resources
	described for the Book Cliffs RFD area.
Minerals—oil and gas—Big Flat-Hatch Point RFD	Approximately 55 acres of disturbance in high site density areas and 76 acres in medium site density areas would occur over the life of the RMP. This represents 0.08% of high site density lands and 0.08% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Lisbon Valley RFD	Approximately 162 acres of disturbance in high site density areas and 349 acres in medium site density areas would occur over the life of the RMP. This represents 0.7% of high site density lands and 1.5% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Eastern Paradox RFD	Approximately 44 acres of disturbance in high site density areas and 100 acres in medium site density areas would occur over the life of the RMP. This represents 0.04% of high site density lands and 0.04% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—geophysical	An estimated 239 acres (0.08%) of land in high site density areas within the MPA and 477 acres (0.08%) of medium site density lands would be subject to disturbance for geophysical work over the life of the RMP. Cultural resources in these areas could be subject to long-term adverse impacts. However, adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts occurring as a result of geophysical activities.
Minerals—salable (mineral materials)	A total of 836,137 acres is available for the disposal of salable minerals. Although adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts, the greater the area available for salable minerals disposal, the greater the potential for adverse impacts because inadvertent damage could occur.
Non-WSA Lands with Wilderness Characteristics	Management of 47,784 acres (16%) of high site density lands and 83,191 acres (13%) of medium site density lands for protection of wilderness characteristics would benefit cultural resources in those areas by limiting surface-disturbing activities and the associated human activity.
Recreation—SRMAs	Approximately 217,994 acres of high site density lands and 391,125 acres of medium site density land would be managed within SRMAs. This represents 72% of high site density lands and 63% of medium site density lands in the MPA. By managing and educating recreationists in these areas, long-term adverse impacts on cultural resources would be reduced. Careful monitoring by the BLM of site condition in these areas would help identify unacceptable impacts early on and allow for implementation of minimization and/or mitigation measures to address these impacts. Given that Alternative B would encompass less recreational development and slightly greater restriction on camping locations and group sizes, impacts to cultural resources under this alternative would be expected to be less than under any other alternative.

Table 4.15. Impacts to Cultural Resources Under Alternative B

Resource Program	Impact on Cultural Resources
Travel Management	Approximately 72,415 acres (24%) of high site density lands and 173,703 acres (28%) of medium site density lands would be closed to OHV use. Approximately 230,160 acres (76%) of high site density lands and 451,446 acres (72%) of medium site density lands would be where OHV use is limited to designated routes. No areas would be open to cross country OHV. Cultural resources in areas closed to OHV use would experience long-term reductions in opportunities for direct and indirect adverse impacts. Cultural resources located in areas where OHV use is limited to designated routes would experience variable beneficial and adverse impacts Approximately 327 linear miles of existing travel routes in high site density areas and 646 miles in medium site density areas would be closed to travel. Cultural resources in these areas would experience moderate, long-term beneficial impacts from reduced opportunities for inadvertent impacts, looting, and vandalism. Existing levels of direct disturbance of cultural sites from foot and motorized traffic along travel routes would continue at current levels. Additionally, indirect impacts such as increased risk of looting and vandalism from users of travel routes would also continue to occur at levels similar to Alternative A.
Visual Resources	Designation of 106,105 acres (35%) of high site density lands and 212,017 acres (34%) of medium site density lands for VRM Class I would benefit cultural resources in those areas by limiting surface-disturbing activities with associated reductions in human activity, reducing both direct disturbance impacts and indirect risks of vandalism and looting.
Woodlands	Woodland products use would be prohibited on 183,677 acres (61%) of high site density lands and 337,089 acres (54%) of medium site density lands within the MPA. Use of woodland products would be allowed on 119,237 acres (39%) of high site density lands and 288,814 acres (46%) of medium site density lands. As described under Alternative A, cultural resources in areas open to woodland products use could experience long-term adverse impacts from direct disturbance (e.g., being driven over or subject to other surface disturbance) or indirect disturbance (e.g., vandalism and looting). Not all areas open to woodland products use contain actual woodlands that would be targeted for use. As such, the actual acres of high and medium site density lands on which wood gathering or harvest would occur is expected to be less than the sum total of lands open for such activities.

Within ACECs and WSRs, an array of management actions would be implemented that vary widely in terms of the level of surface disturbance allowed or prohibited. Since high cultural resource site density areas constitute the areas of greatest concern for potential adverse impacts to cultural resources, only those areas will be discussed relative to ACECs and WSRs.

Areas that would be managed as ACECs under Alternative B include approximately 109,809 acres of lands with high cultural resource site density in proposed ACECs and 45,113 acres of high site density lands in proposed WSRs. Within these areas, management actions include a

range of measures that would benefit cultural resources by affording them direct and indirect protection from adverse impacts. These management actions include such measures as implementing NSO stipulations for leasable minerals and applying non-surface disturbing requirements to salable minerals on approximately 45,806 acres of high site density lands (see Appendix C for a full explanation of stipulations applicable to oil and gas leasing and other surface disturbing activities). Closing areas for leasable and salable minerals on 49,789 acres of high site density lands (where the ACEC overlaps a WSA), managing for VRM Class I (with attendant limitations on surface disturbance) on approximately 73,814 acres of high site density lands, eliminating OHV use on approximately 8,854 acres of high site density lands, restricting livestock grazing on 11,398 acres of high site density lands, and prioritizing cultural resource identification work on 67,126 acres of high site density lands would produce beneficial impacts for cultural resources. Table 4.16 lists the proposed special designations to which these stipulations apply and the acreages of high site density contained therein. If a proposed special designation area is not listed in the table, either the stipulations do not apply to the area or there are no estimated acres of high site density within the area. The stipulations noted above reduce the risk of cultural resource sites being inadvertently impacted by surface-disturbing activities.

Table 4.16. Acres of High Site Density Lands in ACECs with Stipulations Affecting Cultural Resources, Alternative B

Special Designation (All ACECs)	NSO for Leasable/ Salable Minerals	Closed to Leasable/ Salable Minerals	Designated as VRM Class I	Closed to OHV Use	Unavailable/ Limited Grazing	Prioritize Cultural Survey
Behind the Rocks	2,288	0	5,559	5,559	271	7,848
Bookcliffs	2,353	40,033	40,033	0	6117	40,033
Canyon Rims	3,510	0	0	0	0	0
Cisco WTPD Complex	4,699	0	0	0	0	0
Colorado River Corridor	9,592	0	9,592	0	4,233	0
Cottonwood-Diamond	383	6,461	0	0	7,368	6,461
Highway 279/ Shafer Basin/Long Canyon	3,915	0	3,915	0	645	0
Labyrinth Canyon	5,202	0	5,202	0	0	0
Mill Creek Canyon	3,325	0	4,590	0	4,265	4,590
Ten Mile Wash	3,237	0	0	0	0	3,237
Upper Courthouse	4,957	0	0	0	0	4,957
Westwater Canyon	0	3,295	3,295	3,295	0	0
White Wash	717	0	0	0	5	0
Wilson Arch	1,628	0	1,628	0	5	0
Totals	**45,806**	**49,789**	**73,814**	**8,854**	**22,904**	**67,126**
Percent (%) of all high density lands	15%	16%	24%	3%	8%	22%

Alternative B provides for substantially greater acres of NSO stipulations in high site density areas of special designations than any other alternative. Alternative B would also provide for more acres closed to leasable and salable minerals in ACECs than any other alternative. Alternative B would designate approximately 23 times more high site density lands in ACECs as VRM Class I than the next closest alternative (Alternative C) and would close slightly more land in high site density areas in ACECs to OHV travel than would Alternative C. Alternative B would place slightly greater restrictions on livestock grazing in certain ACECs than Alternative C, thereby providing slightly greater long-term benefit to cultural resources in these areas. Alternative B would also provide for the prioritization of cultural resources identification efforts on more acres than any other alternative. Therefore, ACECs proposed in Alternative B would provide for greater protection of cultural resources than in any other alternative.

4.3.2.4.3 ALTERNATIVE C

Impacts to cultural resource under Alternative C incorporate all of the impacts discussed in Section 4.3.2.2, Impacts Common to All Alternatives. Additional impacts to cultural resources under Alternative C, excluding special designations, are described in Table 4.17. Because special designations incorporate an array of individualized management actions, the impact of these designations on cultural resources is discussed separately, following Table 4.17. There are no alternative-specific management actions for fire or paleontological resources.

Table 4.17. Impacts to Cultural Resources Under Alternative C

Resource Program	Impact on Cultural Resources
Cultural Resources	Priority for new inventory and assessment would encompass 30,000 acres, resulting in refined knowledge of cultural resources within the MPA and a better ability to manage these resources effectively. More sites would be targeted for restoration and nomination to the NRHP under this alternative than under Alternatives A and D but fewer would be nominated than under Alternative B. Slightly more sites would be allocated or developed for public use under Alternative C than under Alternative B, and fewer sites would be targeted for restoration. Restoration of damaged sites would result in long-term benefits to the targeted sites. Public interpretation of sites has both short-term and long-term beneficial and adverse impacts to cultural resources through raising awareness of the presence of such resources in the area and educating the public about protection of cultural sites.
Lands and Realty	Designation of ACECs as avoidance areas for rights-of-way would provide long-term benefits to cultural resources in these areas by removing one potential source of ground disturbance and related indirect adverse impacts. Designated utility corridors would encompass 28,400 acres (9%) of high site density lands and 46,899 acres (8%) of medium site density lands. Cultural resources within these utility corridors would be available for adverse impacts from development of the utilities. Application of BLM standard procedures and the Section 106 process would reduce opportunities for such impacts and allow for avoidance, minimization, or mitigation of potential adverse impacts to a large degree.

Table 4.17. Impacts to Cultural Resources Under Alternative C

Resource Program	Impact on Cultural Resources
Livestock Grazing	Grazing would not be available on 114,235 acres. Grazing would be restricted in certain known high (sensitive) site density areas and this would provide long-term beneficial impacts to cultural resources from reduced opportunities for trampling, rubbing, and erosion from loss of vegetation. Fewer such areas would exist under Alternatives A and B but more would exist under Alternative C than under Alternative D. Grazing would be prohibited on 25,177 acres (8%) of high site density lands and 45,200 acres (7%) of medium site density lands within the MPA. Grazing would be allowed on 277,399 acres (92%) of high site density lands and 579,965 acres (93 %) of medium site density lands. Cultural resources in areas available for grazing could experience minimal long-term adverse impacts from trampling and rubbing (e.g., on rock art panels) by livestock. All eligible sites would be mitigated. Cultural resources in areas not available for grazing would experience long-term benefits from reduced opportunities for direct and indirect impacts.
Minerals—oil and gas—Book Cliffs RFD	Approximately 74 acres of disturbance in high site density areas and 641 acres in medium site density areas would occur over the life of the RMP. This represents 0.3% of high site density lands and 0.6% of medium site density lands in the RFD area. Standard BLM policy and the Section 106 process would be applied to all applications for disturbance, thereby reducing opportunities for direct adverse impacts related to this disturbance. Inadvertent impacts and impacts from vandalism and looting that may accompany increased human activity in developed areas may occur.
Minerals—oil and gas—Greater Cisco RFD	Approximately 114 acres of disturbance in high site density areas and 497 acres in medium site density areas would occur over the life of the RMP. This represents 0.9% of high site density lands and 1.1% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Roan Cliffs RFD	Approximately 3 acres of disturbance in high site density areas and 12 acres in medium site density areas would occur over the life of the RMP. This represents 0.01% of high site density lands and 0.03% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Salt Wash RFD	Approximately 11 acres of disturbance in high site density areas and 45 acres in medium site density areas would occur over the life of the RMP. This represents 0.2% of high site density lands and 0.3% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Big Flat-Hatch Point RFD	Approximately 94 acres of disturbance in high site density areas and 139 acres in medium site density areas would occur over the life of the RMP. This represents 0.1% of high site density lands and 0.1% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Lisbon Valley RFD	Approximately 171 acres of disturbance in high site density areas and 360 acres in medium site density areas would occur over the life of the RMP. This represents 0.7% of high site density lands and 0.7% of medium site density lands in the RFD area. Impacts would be similar to

Table 4.17. Impacts to Cultural Resources Under Alternative C

Resource Program	Impact on Cultural Resources
	those described for the Book Cliffs RFD area.
Minerals—oil and gas—Eastern Paradox RFD	Approximately 60 acres of disturbance in high site density areas and 132 acres in medium site density areas would occur over the life of the RMP. This represents 0.05% of high site density lands and 0.05% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—geophysical	An estimated 352 acres (0.1%) of land in high site density areas within the MPA and 705 acres (0.1%) of medium site density lands would be subject to disturbance for geophysical work over the life of the RMP. Cultural resources in these areas could be subject to long-term adverse impacts. However, adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts occurring as a result of geophysical activities.
Minerals—salable (mineral materials)	A total of 1,234,717acres is available for the disposal of salable minerals. Although adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts, the greater the area available for salable minerals disposal, the greater potential the or adverse impacts as inadvertent impacts could occur.
Non-WSA Lands with Wilderness Characteristics	Management of 12,773 acres (4%) of high site density lands and 20,309 acres (3%) of medium site density lands for protection of wilderness characteristics would benefit cultural resources in the Beaver Creek, Fisher Towers and Mary Jane Canyon areas by limiting surface-disturbing activities and the associated human activity.
Recreation—SRMAs	Approximately 160,885 acres (53%) of high site density lands and 205,578 acres (33%) of medium site density land would be managed within SRMAs. By managing and educating recreationists in these areas, long-term adverse impacts on cultural resources would be reduced. Careful monitoring by the BLM of site condition in these areas would help identify unacceptable impacts early on and allow for implementation of minimization and/or mitigation measures to address these impacts.
Travel Management	Approximately 69,215 acres (23%) of high site density lands and 170,608 acres (27%) of medium site density lands would be closed to OHV use. Approximately 232,875 acres (77%) of high site density lands and 453,658 acres (73%) of medium site density lands would limit OHV use to designated routes. Approximately 486 acres (0.2%) of high site density lands and 882 acres (0.1%) of medium site density lands would be open to cross country OHV use. Designated motorcycle routes would be established for approximately 19 miles on high site density lands and 26 miles on medium site density lands. Cultural resources in areas closed to OHV use would experience long-term reductions in opportunities for direct and indirect adverse impacts. As described for Alternative B, cultural resources located in areas where OHV or motorcycle use is limited to designated routes would experience variable beneficial and adverse impacts, and cultural resources located in areas open to cross country OHV use would experience current, or potentially increased, levels of adverse impacts from direct and indirect

Table 4.17. Impacts to Cultural Resources Under Alternative C

Resource Program	Impact on Cultural Resources
	disturbances. Alternative C would have more high and medium site density lands open to cross country OHV use than Alternative B but less than Alternatives A and D. Approximately 238 linear miles of existing travel routes in high site density areas and 537 miles in medium site density areas would be closed to travel. Cultural resources in these areas would experience moderate, long-term beneficial impacts from reduced opportunities for inadvertent impacts, looting, and vandalism. As described under Alternative B, existing levels of direct disturbance of cultural sites from foot and motorized traffic along travel routes would continue at current levels. Additionally, indirect impacts such as looting and vandalism from users of travel routes would also continue to occur at levels similar to Alternative A.
Visual Resources	Designation of 74,672 acres (25%) of high site density lands and 178,751 acres (29%) of medium site density lands as VRM Class I conditions would benefit cultural resources in those areas by limiting surface-disturbing activities and the associated human activity.
Woodlands	Woodland products use would be prohibited on 159,985 acres (53%) of high site density lands and 271,618 acres (43%) of medium site density lands within the MPA. Use of woodland products would be allowed on 143,250 acres (47%) of high site density lands and 354,439 acres (57%) of medium site density lands. As described under Alternative B, cultural resources in areas open to woodland products use could experience long-term adverse impacts from direct disturbance (e.g., being driven over or subject to other surface disturbance) or indirect disturbance (e.g., vandalism and looting). Not all areas open to woodland products use contain actual woodlands that would be targeted for use. As such, the actual acres of high and medium site density lands on which wood gathering or harvest would occur is expected to be less than the sum total of lands open for such activities.

Within ACECs and WSRs, an array of management actions would be implemented that vary widely in terms of the level of surface disturbance allowed or prohibited. Areas that would be managed as ACECs and WSRs under Alternative C include approximately 19,029 acres of lands with high cultural resource site density for ACECs and 29,364 acres of high site density lands for WSRs. Within these areas, management actions include a range of measures that would benefit cultural resources by affording them direct and indirect protection from adverse impacts. These management actions include such measures as implementing NSO stipulations for leasable minerals and applying non-surface disturbing requirements to salable minerals on approximately 11,467 acres of high site density lands (see Appendix C for a full explanation), closing areas for leasable and salable minerals on 7,141 acres of high site density lands (where the ACEC overlaps a WSA), designating as VRM Class I (with attendant limitations on surface disturbance) on approximately 3,200 acres of high site density lands, eliminating OHV use on approximately 7,141 acres of high site density lands, restricting livestock grazing on 10,761 acres of high site density lands, and prioritizing cultural resource identification work on 5,681 acres of high site density lands. Table 4.18 lists the special designations to which these stipulations apply and the

acreages of high site density contained therein. If a particular special designation is not listed in the table, either the stipulations do not apply to the area or there are no estimated acres of high site density within the area. The stipulations noted above reduce the risk of cultural resource sites being inadvertently impacted by surface-disturbing activities.

In general, Alternative C would provide substantially less benefit to cultural resources and less reduction of risk of long-term adverse impacts to these resources than would Alternative B. Alternative C would, however, afford greater protection and reduced risk of long-term adverse impacts when compared to Alternative A, which designates only a single ACEC, and Alternative D, which designates no ACECs.

Table 4.18. Acres of High Site Density Lands in ACECs with Stipulations Affecting Cultural Resources, Alternative C

Special Designation (All ACECs)	NSO for Leasable/ Salable Minerals	Closed to Leasable/ Salable Minerals	Designated as VRM I	Closed to OHV Use	Unavailable/ Limited Grazing	Prioritize Cultural Survey
Behind the Rocks	2,444	0	0	0	0	2,444
Cottonwood-Diamond	383	7,141	0	7,141	7,524	0
Highway 279/ Shafer Basin/Long Canyon	3,915	0	3,200	0	0	0
Mill Creek Canyon	1,488	0	0	0	0	0
Ten Mile Wash	3,237	0	0	0	3,237	3,237
Totals	**11,467**	**7,141**	**3,200**	**7,141**	**10,761**	**5,681**
% of all high site density lands	4%	2%	1%	2%	3.9%	1.9%

4.3.2.4.4 ALTERNATIVE D

Impacts to cultural resources under Alternative D incorporate all of the impacts discussed under Section 4.3.2.2, Impacts Common to All Alternatives. Additional impacts to cultural resources under Alternative D are described in Table 4.19. There are no alternative-specific management actions for fire or paleontological resources, and no special designations would be implemented under this alternative.

Table 4.19. Impacts to Cultural Resources Under Alternative D

Resource Program	Impact on Cultural Resources
Cultural Resources	Priority for new inventory and assessment would encompass 20,000 acres, resulting in refined knowledge of cultural resources within the MPA and a better ability to manage these resources effectively. Fewer sites would be targeted for restoration and nomination to the NRHP under this alternative than under any other action alternative. More sites would be allocated or developed for public use than under any other alternative, and fewer sites would be targeted for restoration. Restoration of damaged sites would result in long-term benefits to the targeted sites. Public interpretation of sites has both short-term and long-term beneficial and adverse impacts to cultural resources through raising awareness of the presence of such resources in the area and educating the public about protection of cultural sites.
Lands and Realty	Designated utility corridors would encompass 29,983 acres (10%) of high site density lands and 51,499 acres (8%) of medium site density lands. Cultural resources within these utility corridors could be subject to adverse impacts from development of the utilities. However, application of BLM standard procedures and the Section 106 process would reduce risk of such impacts and allow for avoidance, minimization, or mitigation of potential adverse impacts to a large degree.
Livestock Grazing	Grazing would not be available on 52,214 acres. Grazing would be removed from certain known high (sensitive) site density areas and provide long-term beneficial impacts to cultural resources from reduced risk of trampling, rubbing, and erosion from loss of vegetation. Fewer such areas would exist under Alternative D than under any other alternative. Grazing would be prohibited on 12,386 acres (4%) of high site density lands and 17,860 acres (3%) of medium site density lands within the MPA. Grazing would be allowed on 290,190 acres (96%) of high site density lands and 607,305 acres (97%) of medium site density lands. Cultural resources in areas available for grazing could experience minimal long-term adverse impacts from trampling and rubbing (e.g., on rock art panels) by livestock. All eligible sites would be mitigated. Cultural resources in areas not available for grazing would experience long-term benefits from reduced risk of direct and indirect impacts.
Minerals—oil and gas—Book Cliffs RFD	Approximately 79 acres of disturbance in high site density areas and 725 acres in medium site density areas would occur over the life of the RMP. This represents 0.4% of high site density lands and 0.6% of medium site density lands in the RFD area. Standard BLM policy and the Section 106 process would be applied to all applications for disturbance, thereby reducing risk of direct adverse impacts related to this disturbance. Inadvertent impacts and impacts from vandalism and looting that may accompany increased human activity in developed areas may occur.
Minerals—oil and gas—Greater Cisco RFD	Approximately 115 acres of disturbance in high site density areas and 498 acres in medium site density areas would occur over the life of the RMP. This represents 0.9% of high site density lands and 1% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Roan Cliffs RFD	Approximately 3 acres of disturbance in high site density areas and 13 acres in medium site density areas would occur over the life of the RMP. This represents 0.01% of high site density lands and 0.03% of medium site

Table 4.19. Impacts to Cultural Resources Under Alternative D

Resource Program	Impact on Cultural Resources
	density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Salt Wash RFD	Approximately 13 acres of disturbance in high site density areas and 51 acres in medium site density areas would occur over the life of the RMP. This represents 0.3% of high site density lands and 0.3% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Big Flat-Hatch Point RFD	Approximately 136 acres of disturbance in high site density areas and 197 acres in medium site density areas would occur over the life of the RMP. This represents 0.2% of high site density lands and 0.2% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Lisbon Valley RFD	Approximately 171 acres of disturbance in high site density areas and 360 acres in medium site density areas would occur over the life of the RMP. This represents 0.7% of high site density lands and 0.7% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—oil and gas—Eastern Paradox RFD	Approximately 77 acres of disturbance in high site density areas and 152 acres in medium site density areas would occur over the life of the RMP. This represents 0.06% of high site density lands and 0.06% of medium site density lands in the RFD area. Impacts would be similar to those described for the Book Cliffs RFD area.
Minerals—geophysical	An estimated 396 acres (0.1%) of land in high site density areas within the MPA and 792 acres (0.1%) of medium site density lands would be subject to disturbance for geophysical work over the life of the RMP. As described for previous alternatives, cultural resources in these areas could be subject to long-term adverse impacts. Adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts occurring as a result of geophysical activities.
Minerals—salable (mineral materials)	A total of 1,387,473 acres is available for the disposal of salable minerals. Although adherence to standard BLM policy and the Section 106 process of the NHPA would reduce the likelihood of adverse impacts, the greater the area available for salable minerals disposal, the greater potential for adverse impacts because inadvertent impacts could result.
Non-WSA Lands with Wilderness Characteristics	No areas would be managed for wilderness characteristics under Alternative D, resulting in greater adverse impacts to cultural resources in those areas because surface disturbing activities would not be precluded.
Recreation—SRMAs	Approximately 74,278 acres (25%) of high site density lands and 83,056 acres (13%) of medium site density lands would be managed within SRMAs. By managing and educating recreationists in these areas, long-term adverse impacts on cultural resources would be reduced. Impacts under this alternative would be similar to those described for Alternative C except that fewer restrictions on group sizes would be implemented and more dispersed camping would be allowed. Total anticipated impacts to cultural resources under Alternative D would be greater than those in Alternative B or C because fewer recreationists would be managed and fewer restrictions would be placed upon them.

Table 4.19. Impacts to Cultural Resources Under Alternative D

Resource Program	Impact on Cultural Resources
Special Designations	No areas would be managed as ACECs or WSRs under Alternative D.
Travel Management	Approximately 17,981 acres (6%) of high site density lands and 21,079 acres (4%) of medium site density lands would be closed to OHV use. Approximately 283,951 acres (94%) of high site density lands and 602,749 acres (96%) of medium site density lands occur where OHV use would be limited to designated routes. Approximately 643 acres (0.2%) of high site density lands and 1,321 acres (0.2%) of medium site density lands would be open to cross country OHV use. Approximately 21 miles of motorcycle routes on high site density lands and 36 miles on medium site density lands would be designated. As described in more detail under Alternative B, cultural resources in areas closed to OHV use would experience long-term reductions in risk of direct and indirect adverse impacts. Cultural resources located in areas where OHV and motorcycle use is limited to designated routes would experience variable beneficial and adverse impacts, and cultural resources located in areas open to cross country OHV use would experience current, or potentially increased, levels of adverse impacts from direct and indirect disturbances. Alternative D would have more high and medium site density lands open to cross country OHV use than Alternatives B and C but less than Alternative A. Approximately 214 linear miles of existing travel routes in high site density areas and 494 miles in medium site density areas would be closed to travel. Cultural resources in these areas would experience moderate, long-term beneficial impacts from reduced risk of inadvertent impacts, looting, and vandalism. As described for previous alternatives, existing levels of direct disturbance of cultural sites from foot and motorized traffic along travel routes would continue at current levels. Additionally, indirect impacts such as looting and vandalism from users of travel routes would also continue to occur at levels similar to Alternative A.
Visual Resources	Designation of 72,703 acres (24%) of high site density lands and 174,314 acres (28%) of medium site density lands as VRM Class I would benefit cultural resources in those areas by limiting surface-disturbing activities and the associated human activity.
Woodlands	Woodland products use would be prohibited on 144,146 acres (48%) of high site density lands and 252,959 acres (40%) of medium site density lands within the MPA. Use of woodland products would be allowed on 158,768 acres (52%) of high site density lands and 372,944 acres (60%) of medium site density lands. As described under Alternative A, cultural resources in areas open to woodland products use could experience long-term adverse impacts from direct disturbance (e.g., being driven over or subject to other surface disturbance) or indirect disturbance (e.g., vandalism and looting). Not all areas open to woodland products use contain actual woodlands that would be targeted for use. As such, the actual acres of high and medium site density lands on which wood gathering or harvest would occur is expected to be less than the sum total of lands open for such activities.

4.3.2.5 Summary of Impacts

In general, Alternative B provides for the most potential beneficial impact to cultural resources within the MPA of all the alternatives. This is because Alternative B would implement greater restrictions on surface-disturbing activities (and the damage these activities could advertently or inadvertently cause to cultural resources) such as mineral development, greater restrictions on recreational use and OHV travel, and more areas of special designation with their attendant management restrictions on land use such as VRM Class I, surface disturbance, and OHV travel than any other alternative. These management decisions reduce the risk of cultural resources being inadvertently impacted in an adverse way. Alternative B would also implement more management decisions focused on pro-active management of cultural resources through the development of integrated cultural-recreational management plans. Based upon these same key elements, Alternative C would provide the next greatest benefit to cultural resources, followed by Alternative A. Alternative D would provide the least amount of benefit to cultural resources in the MPA of all alternatives.

4.3.3 Fire Management

This section presents the impacts to fire management from management actions for the resources and resource uses discussed in Chapter 2. Existing conditions concerning fire management are described in Chapter 3.

The most direct and long-term impacts to fire management within the MPA would result from the decisions of the fire management program itself. As noted in Chapter 3, fire management within the MPA is the responsibility of the Moab Fire District (MFD), which encompasses the Monticello, Moab, and Price Planning Areas. The proposed decisions expected to affect fire management are: air quality, lands and realty, minerals, recreation, riparian, special designations, special status species, travel, wildlife, and woodlands.

4.3.3.1 Impacts Common to All Alternatives

4.3.3.1.1 Impacts of Air Quality Decisions on Fire Management

Under all alternatives, prescribed burns would be consistent with the State of Utah Department of Environmental Quality's (UDEQ's) permitting process and timed in conjunction with meteorological conditions so as to minimize smoke impacts. In addition, the BLM would comply with the current Smoke Management MOU between BLM, USFS, and UDAQ. This may restrict the use of prescribed fire in terms of timing and size of treatments. However, these limitations would not substantially reduce the effectiveness of long-term fire management or increase fire risk in the MPA.

4.3.3.1.2 Impacts of Fire Management Decisions on Fire Management

The comprehensive Utah Land Use Plan Amendment for Fire and Fuels Management (LUP Amendment) of September 2005 (BLM 2005c) currently guides fire management in the MPA. Direction and guidance approved by the LUP Amendment is incorporated by reference into this

RMP. The LUP Amendment provides fire management direction that is common to all alternatives being considered in this Draft RMP EIS. Accordingly, the impacts of implementing the LUP Amendment within the MPA would also be identical for all alternatives. Readers should note that the potential impacts of implementing the LUP Amendment across the entire MFD, including the MPA, were analyzed as part of the Environmental Assessment prepared for that document (BLM 2005c: 4-1 to 4-50).

Under all alternatives, the Moab Fire District Fire Management Plan (FMP) (BLM 2006b) will be updated and amended to meet the direction and objectives of this RMP. Under the revised FMP, fire management program decisions would focus on the goal of improving Fire Regime Condition Class (FRCC) and moving lands within the MPA toward the Desired Wildland Fire Condition (DWFC). These condition classes and desired conditions are discussed in greater detail in Chapter 3 of this Draft EIS and in the FMP (BLM 2006b: 3-27 to 3-32). The implementation goals of the FMP are to improve fire conditions, including achieving desired fuels loading, and controlling wildfire location, extent, and/or severity. Accordingly, this section quantitatively analyzes the impacts from fire management decisions based on the relative acreage of each vegetation cover type that would be treated to reduce fuels loading.

Under all alternatives, 5,000 to 10,000 acres would be treated annually across the MPA depending on budgetary and time constraints. Wildland-Urban Interface (WUI) areas, areas with fuel loading that could potentially result in the loss of ecosystem components following wildland fire, and areas that meet other management goals and objectives would be treated with prescribed fire and non-fire treatments (mechanical removal, chemical and biological treatments, manual removal, seeding). The overall impact of these treatments would be improvement in FRCC within the MPA and movement towards the DWFC for the treated areas. The majority of these treatments would likely be concentrated in the pinyon-juniper vegetation type, including historical sagebrush/grassland that has been encroached upon by pinyon-juniper (BLM 2005c: 2-4 to 2-6). The majority of this vegetation type is in FRCC 2 or 3, which indicates that it suffers moderate to high departure (>66% variation) from historical fire return interval and/or vegetation condition/fuel loading. The main reasons the majority of the pinyon-juniper in the MPA falls within this FRCC are 1) loss of native understory of pinyon-juniper stands; 2) cheatgrass invasion of disturbed pinyon-juniper stands; and 3) fuel loading in uncharacteristically thick pinyon-juniper stands (BLM 2006b: 3-30).

Proactive fuels loading (vegetation) treatments would be prioritized for different areas based upon the severity of possible impacts from unplanned wildland fire. The priority areas include WUI zones, areas where fuels loading could potentially result in loss of ecosystem components following wildland fire, and areas where other resource management program goals are incompatible with unplanned wildland fire. Focusing treatment on these areas would reduce fire risk in the more vulnerable or sensitive locations of the MPA.

If the MFD is able to successfully implement fuels treatments over a maximum number of desired acres in a given year, a general transition toward improved FRCC and DWFC in the MPA could eventually be realized. Landscape-level fuel treatments require a long-term commitment of resources to implement, monitor, and maintain; implementation can depend on a myriad of factors such as climate, threats or infestation from invasive species, and other

variables; and, acreage goals can be altered or transformed by unexpected factors such as catastrophic wildland fire, drought, or changes in T&E habitat. In consideration of these various aspects, improved FRCC and DWFC as well as other management goals and objectives may take generations for actual accomplishments to be realized.

These treatment acreages identified in the LUP are only approximate long-term goals, but are the best available estimates for the purposes of analysis.

4.3.3.1.3 Impacts of Lands and Realty Decisions on Fire Management

Under all alternatives, minimum impact criteria for filming would prohibit the use of pyrotechnics and explosives, as well as limiting the numbers of people and vehicles in sensitive areas. This would provide a slight decrease in the risk of inadvertent fire starts from human causes.

4.3.3.1.4 Impacts of Riparian Decisions on Fire Management

Under all alternatives, integrated species management would continue to be used to accomplish riparian restoration through biological, chemical, mechanical, and manual methods (e.g., tamarisk control, willow plantings). These actions would substantially reduce the risk of wildfire in riparian areas, particularly in areas where native willow habitat has been restored.

4.3.3.2 Alternatives Impacts

4.3.3.2.1 Impacts of Minerals Decisions on Fire Management

Minerals decisions impacting fire management are largely associated with potential increased risk of human-caused fires because of mineral development. These impacts are best compared by showing relative differences in the acreage of lands open for surface-disturbing minerals development under each alternative (Table 4.20).

In general, Alternative B has the least amount of land available for surface-disturbing mineral extraction, followed by Alternatives C, D, and A respectively. Additionally, it should be noted that the actual amount of development predicted over the life of the plan is relatively low; therefore mineral development activities would likely have a relatively low impact on fire management and fire risk in comparison to other human activities such as recreational visitation.

Table 4.20. Acreage of MPA Lands Open to Surface-disturbing Mineral Development (% of Planning Area)

Development	Alternative A	Alternative B	Alternative C	Alternative D
Leasable				
Open (Standard Stipulations or TL/CSU)	1,427,949 (78%)	1,054,111 (45%)	1,234,267 (68%)	1,387,473 (76%)
Predicted acreage of disturbance (from RFD)	6,765	3,975	6,480	6,720
Locatable				
Open	1,389,531 (76%)	1,389,531 (76%)	1,373,649 (75%)	1,389,531 (76%)
Salable				
Open/Open Special Conditions	1,467,768 (81%)	836,137 (46%)	1,234,267 (68%)	1,387,473 (76%)

4.3.3.2.2 Impacts of Non-WSA Lands with Wilderness Characteristics Decisions on Fire Management

4.3.3.2.2.1 Alternatives A and D

No lands would be managed for wilderness characteristics under Alternatives A and D; there would be no impacts to travel management from these decisions.

4.3.3.2.2.2 Alternative B

Under Alternative B, management of 266,485 acres (in 32 areas) of non-WSA lands with wilderness characteristics would limit the types of fuel treatments and fire management activities that could be utilized to restore natural fire regimes in fire-dependent and adapted ecosystems. This would preclude mechanical treatments or other surface disturbing treatments that could affect wilderness characteristics. When fire must be suppressed in these areas, the ESR plan would be required to restore the area to its natural character.

4.3.3.2.2.3 Alternative C

Under Alternative C, management of 47,761 acres (in Beaver Creek, Fisher Towers, and Mary Jane Canyon) of non-WSA lands with wilderness characteristics would limit the types of fuel treatments and fire management activities that could be utilized to restore natural fire regimes in fire-dependent and adapted ecosystems. This would preclude mechanical treatments or other surface disturbing treatments that could affect wilderness characteristics. When fire must be suppressed in these areas, the ESR plan would be required to restore the area to its natural character.

4.3.3.2.3 IMPACTS OF RECREATION DECISIONS ON FIRE MANAGEMENT

Recreation decisions impacting fire management include restrictions on campfires and dispersed camping in Special Recreation Management Areas (SRMAs). Camping and campfire restrictions would decrease the risk of human-caused wildland fire starts. Table 4.21 lists the acreage of SRMAs by alternative.

Table 4.21. SRMA Acreage by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
SRMA Acreage	151,252	976,173	658,642	277,471

Alternative B requires an SRP when a group has 15 vehicles, meaning that there would be more opportunity to educate visitors on preventing wildfire. Alternative B would have less risk of human-caused wildland fire than the other alternatives, although Alternative C would pose less risk than that posed by Alternative D.

4.3.3.2.4 IMPACTS OF SPECIAL DESIGNATION DECISIONS ON FIRE MANAGEMENT

Special designations include ACECs, Wild and Scenic Rivers (WSRs), Designated Wilderness and WSAs. Proposed management prescriptions for WSRs have negligible impact on fire management, as they do not further restrict vegetation management or woodland harvest. Additionally, fewer than 100 acres of prescribed fire and non-fire fuels treatments (each) are planned within riparian vegetation types in the MPA under the Moab FMP; therefore, proposed WSRs are unlikely to affect or be affected by potential fire management actions. Accordingly, WSR impacts on fire management are not analyzed further.

Under all alternatives, a total of approximately 353,615 acres would be within WSAs. These acreages would be closed to woodland harvest and surface-disturbing vegetation treatments. Accordingly, this acreage (approximately 19% of the MPA) would have limited access for proactive fuel reduction or manipulation of vegetation types toward DWFC. However, over the long-term, some vegetation treatments may be allowed if they are non-impairing. These would include reseeding with native species after a fire and pruning. However, stand conversion activities such as mechanical removal of pinyon-juniper encroachment or Douglas fir encroachment on aspen would not be permitted under H-8550-1 (Interim Management Policy For Lands Under Wilderness Review). Fire suppression would be permitted with the understanding that it would be conducted with a minimum amount of mechanical and/or motorized resources. Limitations on woodland harvest, surface disturbing vegetation treatments, and fire suppression techniques in WSAs would increase the fire risk in these areas under all alternatives.

Overall, designation of ACECs and the subsequent restrictions on surface disturbance in these areas would have the greatest impact on fire management activities in the MPA. Restrictions on vegetation treatments in ACECs could increase long-term fire risk due to fuel loading. Table 4.22 below summarizes the restrictions on fire and fuels treatments in the MPA.

Table 4.22. Acreage of ACEC Restrictions on Fire Management and Fuels Treatment (acres)

Restriction	Alternative A	Alternative B	Alternative C	Alternative D
No Surface-disturbing Vegetation Treatments	0	79,848	5,201	0

Because Alternative B designates the greatest acres of ACECs among the four alternatives, it thereby restricts the greatest amount of acreage from vegetation treatments, followed by Alternatives C, D, and A, respectively. Accordingly, Alternatives A and D would likely result in the least amount of long-term fire risk in these areas, followed by Alternatives C and B, respectively.

Restrictions on dispersed camping, which would lower the risk of human-caused fire ignitions, are imposed by ACEC management in Alternatives B and C. Alternative B restricts dispersed camping on 115,529 acres; Alternative C restricts dispersed camping on 13,902 acres. There are no ACECs proposed in Alternatives A and D, and thus no restrictions on dispersed camping. Therefore, Alternative B provides the least risk of human-caused fire ignitions.

4.3.3.2.5 Impacts of Special Status Species Decisions on Fire Management

Special status species have limited distributions and suitable habitat, making relocation or re-establishment elsewhere difficult if their habitat is disturbed or altered. Thus, the protection of special status species' habitat from disturbance generally restricts options for fuels reduction and vegetative treatments where habitat is present in the MPA. Restrictions due to the presence of special status species or their habitat are often seasonal and limited to relatively small areas, such as those surrounding nests or (sage grouse) leks. Because Federally threatened and endangered species are protected under the Endangered Species Act, their management prescriptions and the resulting restrictions on fire management are generally common to all alternatives. Fire management options, including surface-disturbing vegetative treatments and the use of wildfire and prescribed burns as management tools, are generally limited in the presence or habitat of threatened and endangered species. Species present in the MPA whose recovery plans place (widely variable) limitations on such treatments include: Mexican spotted owl, southwestern willow flycatcher, bald eagle, Colorado River endangered fish (several), golden eagle, burrowing owl, ferruginous hawk, yellow-billed cuckoo, and Jones' cycladenia.

The acres of habitat with seasonal restrictions on surface-disturbing activities vary for four special status species that are not threatened or endangered: the greater sage grouse, the Gunnison sage grouse, the white tailed prairie dog, and the Gunnison prairie dog. These restrictions are shown in Table 4.23, below.

Table 4.23. Acres of Seasonal Restrictions on Surface-disturbing Activities in Sensitive Species Habitat Areas (For Decisions Not Common To All Alternatives Only)

	Alternative A	Alternative B	Alternative C	Alternative D
Greater sage grouse	0	12,850	3,068	1,986
Gunnison sage grouse	0	246,107	175,727	41,620
White tailed prairie dog	0	284,529[*#]	117,481[+]	31,186[+]
Gunnison Prairie dog	0	10,700[*]	10,700[+]	0

[*]Restrictions apply within 1300 ft of active colonies in this area
[+]Restrictions apply within 660 ft of active colonies in this area
[#]199,505 of these acres are subject to year-round restrictions as part of an ACEC.

Thus, seasonal restrictions on surface-disturbing activities due to protection for special status species vary by alternative, with Alternative B being the most restrictive for fire management actions. Restrictions on fire management would increase the long-term risk of wildfire.

4.3.3.2.6 Impacts of Travel Decisions on Fire Management

Motorized use in the MPA creates a limited risk of human-caused fire. This risk includes heat and sparks from motors and exhaust systems. This risk is increased substantially if travel occurs off of designated routes. The cross-country motorized travel category poses the greatest risk of inadvertent wildland fire starts, followed by travel on designated routes. Cross country travel is much more likely to bring the heat and sparks from exhaust systems in direct contact with vegetation than travel on designated routes, which are typically devoid of vegetation. Closing areas to motorized travel largely eliminates the risk of inadvertent fire starts from motorized vehicles.

All of the action alternatives would lessen the impact of human-caused fires than Alternative A due to the reduction of motorized cross-country travel under those alternatives (Table 4.24). Alternative B has the greatest acreage closed to motorized travel, followed closely by Alternative C. Alternatives A and D have less area closed to motorized travel than Alternatives B or C. Alternative D has the most acreage where motorized travel would be limited to designated routes (and the least amount of acreage closed to motorized travel), followed closely by Alternatives B and C which have similar acreages, then by Alternative A. Thus, Alternative B provides the least amount of travel-related risk to fire management, followed closely by Alternative C. Alternative D would have some additional risk and Alternative A would have substantially more risk than Alternatives B and C.

Table 4.24. Travel Restrictions Impacting Fire Management and Risk (acres)

	Alternative A	Alternative B	Alternative C	Alternative D
OHV Use Categories				
Open to Cross-Country Travel	678,250	0	1,866	3,348
Limited to Existing/Designated Routes	1,113,470	1,463,248	1,468,852	1,788,372
Closed	29,654	358,126	349,843	29,654
Miles of Designated Roads and Trails				
Primitive (Level D) Road	5,033	2,162	2,527	2,689
Motorcycle Trail	129	122	221	255

4.3.3.2.7 Impacts of Wildlife Decisions on Fire Management

Under all alternatives, surface-disturbing activities and vegetation alteration would be avoided during the nesting season for migratory birds (May 1 through July 30). In addition, surface-disturbing activities would be precluded in 105,636 acres of deer and elk summer range (within the Book Cliffs and La Sal Wildlife Management Units) between May 15 and June 30. These restrictions would limit fuels reduction treatments during these time periods.

Some management actions common to all alternatives would benefit fire management in the MPA. Dispersed camping in riparian areas would be restricted under all alternatives, which would slightly reduce the likelihood of human-caused wildfire in these areas, as would the implementation of a limited fire suppression policy (and initiation of prescribed fires) where treatment by fire would increase vegetation productivity and increase forage for wildlife, which is also proposed under all alternatives. A prescription to increase elk forage on 4,000 acres through vegetation treatments including prescribed fire would also benefit fire management under all alternatives.

Seasonal restrictions on surface-disturbing activities specific to each alternative are shown in Table 4.25, below. These prohibitions would restrict fire management activities during specific time periods, and reduce the options available for fuels reduction, surface-disturbing vegetative treatments, and prescribed fire. In general, prohibitions on surface disturbance to protect wildlife would be most restrictive to fire management under Alternative B, followed by Alternatives C, D, and A, respectively. Alternatives that are the most restrictive to fire management carry the highest long-term risk of large or catastrophic wildfire due to increased fuel loading.

Table 4.25. Acres of Seasonal Restrictions on Surface-disturbing Activities in Wildlife Habitat Areas (For Decisions Not Common To All Alternatives)

	Alternative A	Alternative B	Alternative C	Alternative D
Pronghorn	0	822,001*	293,741*	78,477*
Deer and Elk	0	635,774+	349,955#	349,955&

*Restrictions apply from May 1 to June 15
+ Restrictions apply from November 1 to May 15
# Restrictions apply from November 15 to April 15
&Restrictions apply from December 1 to April 15

4.3.3.2.8 Impacts of Woodland Decisions on Fire Management

Under all alternatives, one of the goals of woodland management decisions would be to encourage, where feasible, the harvest of forest products in areas of proposed or existing vegetation treatments to lessen the need for additional treatment or land disturbance. Where feasible, this practice would help improve FRCC and reduce the need for additional fuels treatments to reach DWFC. All alternatives would seek to use woodland harvest to assist in managing woodlands to accomplish goals outlined in the Fire Management Plan. Thus, woodland management decisions would generally be made to support fire management goals, and the impacts of woodlands management decisions would generally have beneficial impacts on fire management.

The primary means of assessing the impacts of woodland management decisions on fire management is the number of acres under each alternative that would allow or prevent woodland harvest and wood gathering, which are shown in Table 4.26, below. Alternatives that allow woodland harvest and wood gathering over larger acreages provide greater benefits to fire management goals by allowing woodland harvest to help reduce fuel loading. Alternatives A and D (equally) provide the greatest benefit to fire management, followed by Alternatives C and B.

Table 4.26. Woodland Resource Decisions Impacting Fire Management and Risk (acres)

	Alternative A	Alternative B	Alternative C	Alternative D
Open to Woodland Harvest and Wood Gathering	1,243,734	1,071,335	1,212,886	1,243,734
Closed to Woodland Harvest and Wood Gathering	609,385	781,784	640,223	609,385

4.3.4 HEALTH AND SAFETY

This section discusses impacts to health and safety from management actions of other resources and resource uses.

Management actions associated with the following resources and resource uses would have negligible impacts on health and safety, regardless of the alternative chosen: air quality; cultural resources, paleontological resources; fire management; lands and realty; livestock grazing; recreation and travel management; vegetation, woodlands; riparian; soils and water; wilderness characteristics, wildlife; and special status species; special designations; visual resource management. The impacts would be negligible, and are dismissed from further analysis, because none of these resources have management prescriptions that would generate hazardous wastes, affect cleanup of toxic or hazardous waste spills, or increase or decrease the dangers of existing abandoned minelands (AML) sites and related AML water quality.

4.3.4.1 HAZARDOUS MATERIALS

The sources of hazardous materials are subject to the Federal and state laws described in Chapter 3. These laws and regulations are designed to safeguard human health and safety and to protect other environmental resources. Implementation of the laws and regulations would minimize the risks associated with the use, storage, and disposal of hazardous materials.

4.3.4.1.1 IMPACTS COMMON TO ALL ALTERNATIVES

Under all of the alternatives, environmental conditions, as well as public health and safety, would be protected as a result of the BLM hazardous materials management practices. Authorized uses of hazardous materials would adhere to Federal and state requirements to reduce or eliminate impacts. The procedures in place within the BLM as well as state and local agencies would address accidental events and unauthorized use. These procedures would help to minimize public exposure and environmental impacts to the extent possible.

4.3.4.1.1.1 Minerals

According to the Moab RFD, the projected maximum number of wells within BLM managed lands over the next 15 years is 451 with future oil and gas drilling projected at about 30 wells per year. The surface disturbance for construction of a well pad, road, and associated pipelines is estimated at 15 acres. The total projected surface disturbance for oil and gas drilling is approximately 6,772 acres. Given the small number of wells projected over the next 15 years regardless of the alternative, the overall hazardous material risk would be negligible. However, any mineral exploration and development would cause increases in hazardous material risks in the MPA. These impacts would be adverse and long-term. The following are oil and gas related developments that would pose hazardous materials risks across all alternatives.

4.3.4.1.1.2 Pipelines

The installation of pipelines and supporting services for pipelines (e.g., compressor stations) would be necessary for oil and gas development. Pipelines and their associated features have the potential to leak or spill oil, gas, natural gas condensate, or other hazardous materials. The companies installing and operating pipelines in the MPA are responsible for understanding and abiding by the applicable hazardous material laws and regulations. The MFO would be responsible for inspecting and monitoring these operations to ensure that these companies are in compliance with all applicable laws and regulations.

4.3.4.1.1.3 Transportation

Minerals development activities would increase the instances of hazardous materials transportation. Transportation (e.g., trucking) companies are responsible for understanding and abiding by all applicable hazardous materials transportation laws and regulations.

4.3.4.1.1.4 Gas Flowline Leakage or Ruptures

The potential exists for gas flowline leakage or ruptures during natural gas extraction and processing. The U.S. Department of Transportation data indicate that an average of one rupture annually should be expected for every 5,000 miles of pipeline (Office of Pipeline Safety 2005). More than 50% of pipeline ruptures occur as a result of heavy equipment striking the pipeline. Such ruptures would potentially cause a fire or explosion if a spark or open flame ignited the natural gas escaping from the pipeline.

Pipeline design, materials, maintenance, and abandonment procedures are required to meet the standards set forth in U.S. Department of Transportation (DOT) regulations (49 CFR Part 192, Transportation of Natural Gas by Pipelines).

4.3.4.1.1.5 Well Fires and Explosions

Well fires are rare but can occur under certain conditions, and a well fire could result from a blowout during drilling activities or from a gas leak during extraction operations. Conditions that would cause gas accumulation in a confined space, and ignition by a spark would likely produce a well fire.

4.3.4.1.1.6 Geologic Hazards

The potential risks associated with oil and gas development include geologic hazards. These hazards include natural gas seepage, hydrogen sulfide releases, abnormally high gas pressure, seismic activity, fires, and explosions.

4.3.4.1.2 Alternatives Impacts

Due to the small amount of oil and gas wells (451) predicted over the next 15 years within the MPA and the fact that the amount of wells drilled between each alternative would vary only

slightly, impacts between alternatives would also vary only slightly. However, the more acres open to oil and gas development, the more pipelines, power lines, transportation, etc. would be needed. Therefore, the alternative with the greatest amount of acreage open for development would have a slightly higher risk of hazardous materials impacts than the alternatives with less acreage open for development. For example, impacts would be slightly higher between Alternative D versus Alternative C as more acres would be open to development and thus require more oil and gas infrastructure.

Mining and exploration operations associated with other minerals such as uranium, copper, sand and gravel, are currently a minor user and producer of hazardous materials within the MPA. The potentially hazardous materials used in these operations are similar to those used by oil and gas development. As with oil and gas, the differences in potential mineral development between the alternatives are minor, with the same number of acres of surface-disturbance projected across alternatives. Therefore, the potential impacts are similar under all alternatives.

4.3.4.1.2.1 Alternative A

Under Alternative A, approximately 1,427,949 acres of BLM administered lands would be open for oil and gas development with standard or controlled surface use/timing lease stipulations. About 451 wells are projected under this alternative. Oil and gas development under Alternative A would pose a hazardous materials risk that results from the use, generation, storage, transportation, and/or disposal of hazardous material on 451 wells.

4.3.4.1.2.2 Alternative B

Under Alternative B, approximately 808,096 acres of BLM administered lands would be open for oil and gas development with standard or controlled surface use/timing lease stipulations. About 255 wells are projected under this alternative. This represents a 43% decrease in the total amount of acres available for leasing and the number of wells projected compared to Alternative A. A 43% decrease in the total number of acres open to oil and gas development and the number of wells projected would decrease the use, generation, storage, transportation, and/or disposal of hazardous materials.

4.3.4.1.2.3 Alternative C

Under Alternative C, approximately 1,234,267 acres of BLM administered lands would be open for oil and gas development with standard or controlled surface use/timing lease stipulations. About 432 wells are projected under this alternative. This also represents a 14% decrease in the total amount of acres available for leasing and the number of wells projected compared to Alternative A. A 14% decrease in the total number of acres open to oil and gas development and the number of wells projected would slightly decrease the use, generation, storage, transportation, and/or disposal of hazardous materials.

4.3.4.1.2.4 Alternative D

Under Alternative D, approximately 1,387,473 acres of BLM administered lands would be open for oil and gas development with standard or controlled surface use/timing lease stipulations. About 449 wells are projected under this alternative. This also represents a 3% decrease in the total amount of acres available for leasing and the number of wells projected compared to Alternative A. A 3% increase in the total number of acres open to oil and gas development and the number of wells projected would minimally decrease the use, generation, storage, transportation, and/or disposal of hazardous materials.

4.3.4.2 Abandoned Mine Lands (AML)

The MFO recognizes the need to identify and address physical safety and environmental hazards at all AML sites on public lands. Under all alternatives, abandoned mine land sites would be prioritized for remediation and closure, based on physical safety, watershed protection, and funding by other agencies. Abandoned mine lands would be considered in future recreation management area designations, land use planning, and all applicable use authorizations.

In conformance with BLM's long-term strategies and national policies regarding AML, this RMP recognizes the need to work with our partners toward identifying and addressing physical safety and environmental hazards at all AML sites on public lands. In order to accomplish this long-term goal, criteria under the national policies would be established under all alternatives to assist in determining priorities for site and area mitigation and reclamation. See the Alternatives Matrix in Chapter 2 (Table 2.1) for AML program priorities.

4.3.5 Lands and Realty

This section discusses impacts to soils from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning lands and realty are described in Chapter 3.

Impacts to the lands and realty program stem from those resource decisions that limit or hinder permitting rights-of-way (ROWs) or other land use authorizations, or affect the BLM's ability to acquire and dispose of land or make other land tenure adjustments (LTAs). Rights-of-way are issued for the placement of roads, powerlines, pipelines, communications sites, wind and solar energy sites on public lands. Within the RMP, such decisions primarily result from and are affected by management actions from the minerals, special designations and wilderness characteristics, as well as lands and realty itself. In addition, the wildlife, vegetation, recreation, riparian, soils/watersheds, visual resources, special status species, and cultural resources programs collectively impact the lands and realty program through a variety of restrictions on surface disturbing activities and availability of lands for disposal. As such, potential impacts from these program decisions will be analyzed in this chapter.

The specific program management decisions regarding the following resources and resource uses would have negligible impacts (short-term and/or long-term, as well as direct and/or indirect) on lands and realty regardless of the alternative chosen: air quality; fire management; health and

safety; livestock grazing; paleontological resources; and woodlands. The impacts would be negligible because protecting air quality, reducing wildland fire risks and the health and safety risks of hazardous materials, identifying livestock utilization levels and complying with the standards and guidelines for livestock grazing, protecting fossils for scientific study and recreational collection, and permitting woodland harvesting would not alter the Moab FO's authority to designate ROWs, or to withdraw, acquire, and/or exchange lands under its administration.

4.3.5.1 Impacts Common to All Alternatives

Wind and solar energy development would be permissible within the MPA. Authorizations for wind and solar energy uses would incorporate the best management practices contained in the Final Wind Energy Programmatic EIS (BLM 2005d: 2-10 to 2-24) and would be provided via ROW grants. Implementation of these measures would provide for the use of MPA lands for alternative energy and communications uses while meeting the individual and overall resource management goals of the RMP.

A total of 354,015 acres (within WSAs and the Black Ridge Wilderness Area) are closed to surface disturbing activities and thus exclude the granting of new ROWs. They are managed as ROW exclusion areas under all alternatives. The impacts of these exclusions include precluding the placement of ROWs and facilities, limiting future access, potentially delaying or increasing the cost of energy supplies, and creating communications dead zones or potentially delaying the availability of communications services. Exclusions on the placement of ROWs could also result in ROWs being located in less desirable or less economically feasible locations. It should be noted that this is a non-discretionary decision.

ROWs would continue to be granted in certain areas under all of the management alternatives, and LTAs would also be allowed under all alternatives except in exclusion areas. Granting of ROWs generally would accommodate the placement of facilities, enhance access to facilities and lands within the MPA, and promote energy supply/transmission and communications. Granting of ROWs would also help to minimize the cost of energy and communications developments, and promote trails and recreation. LTAs would help to facilitate access to the MPA and adjoining properties, improve the BLM's management ability, reduce conflicts with adjoining landowners and surrounding communities, protect sensitive resources when lands are acquired, and accommodate surrounding communities' needs.

Impacts common to all alternatives would also occur due to visual resource management decisions, cultural resource management decisions, and special status species management decisions. Utility corridors within areas designated as VRM Class II would be managed as VRM Class III for utility projects only. Downgrading the VRM class of utility corridors would result in fewer restrictions on utility projects and potentially reduce their cost. All ROW grants would comply with applicable rules and regulations regarding cultural resources and special status species, and the presence of protected resources could alter the route of proposed ROWs. Compliance measures and the presence of protected resources are unlikely to prevent the development of specific ROWs in available areas.

4.3.5.2 Impacts Common to All Action Alternatives (B, C and D)

Several lands and realty decisions would have impacts common to all of the action alternatives, or all alternatives other than Alternative A. The MFO would work cooperatively with the State of Utah and with private landowners to identify opportunities for LTAs using the criteria established for disposal and acquisition of lands. LTAs would facilitate BLM efforts to meet management goals and objectives, as set forth in this RMP. The application of minimum-impact filming criteria (Appendix B) would streamline the permit application process and encourage filming companies to use previously approved locations.

In addition, lands and realty decisions would place surface disturbance restrictions on several parcels affecting utilities and ROWs. A prohibition on surface disturbance within the Moab Canyon portion of the Hwy 191 utility corridor (for other than utility projects) would reduce surface use conflicts and maximize the efficiency of new utility projects. Allowing no surface disturbing activities within the Three Rivers and Westwater withdrawals would restrict the granting of new rights-of-way in these areas. The impacts of these avoidance areas include restricting the placement of ROWs and facilities, limiting future access, delaying or increasing the cost of energy supplies, and creating communications dead zones or delaying the availability of communications services. Limitations on the placement of ROWs could also result in ROWs being located in less desirable or less economically feasible locations.

Finally, the existing utility corridor from Cisco to Highway 191 north of Arches National Park would be discontinued under all action alternatives. While this would eliminate one existing utility corridor in the MPA, other corridors for utilities placement would be developed as part of individual action alternatives. These other utility corridors are discussed by alternative in subsequent sections of this chapter.

4.3.5.3 Alternatives Impacts

4.3.5.3.1 Alternative A

Land and realty decisions include the disposal of BLM lands, acquisition of non-Federal lands, modification of utility corridors, and designation of ROW exclusion and avoidance areas. Under Alternative A, a total of 12,415 acres of land are identified for disposal. These lands meet the BLM requirements for disposal and their transfer out of BLM ownership would be consistent with the LTA policies of the agency. Additional lands are identified for further study to determine if they meet the criteria for disposal. The disposal of 12,415 acres would have a negligible impact on the net amount of land under BLM jurisdiction in the MPA. Fewer acres of land are identified for disposal under Alternative A than under any other alternative. Disposals would help accommodate resource management needs and the needs of adjacent communities.

In addition to the 354,015 acres (within WSAs and the Black Ridge Wilderness Area) which exclude the granting of new ROWs, an additional 38,912 acres on which no surface disturbing activities are allowed would be avoidance areas for new ROWs. Exclusion and avoidance areas impact lands and realty by restricting the placement of ROWs and facilities, limiting future access, delaying or increasing the cost of energy supplies, and creating communications dead zones or delaying the availability of communications services. Limitations on the placement of

ROWs could also result in ROWs being located in less desirable or less economically feasible locations. Alternative A has the smallest area of exclusion and avoidance areas, and thus the fewest limitations on the placement of future ROWs.

Under Alternative A, utility corridors would retain their current size and location. A total of 32,502 acres would be designated as utility corridors. Alternative A would have approximately 53% of the acreage of the utility corridor delineated in Alternative B, 20% of the acreage delineated in Alternative C, and 16% of the acreage of the utility corridor delineated in Alternative D. With the exception of one corridor in Alternative A that has never been used, all alternatives contain the same corridors, but vary in width. In the future, decreased width could be a limiting factor in the ability to accommodate major utilities.

A wide variety of other resource management decisions can also affect or limit the placement of ROWs and facilities on BLM lands, due to timing or controlled surface use limitations on surface disturbing activities. Resource actions affecting the size and duration of areas limiting surface disturbing activities would occur from , riparian, soils and watershed, visual resources, special status species, and wildlife management decisions. Limitations on surface disturbing activities would preclude or hinder the placement of new ROWs, including possibly increasing their cost, limiting access to some areas of the MPA, or delaying the completion of ROWs (in the case of seasonal limitations). Alternative A has 389,605 acres where restrictions would be imposed on the development and operation of ROWs. However, with 1,038,344 acres available for ROWs with no restrictions, Alternative A is the least restrictive of surface disturbing activities, and thus has the least impact on the construction of future ROWs.

Minerals and energy development decisions would affect the processing ROW grants (primarily roads and pipelines). A total of 451 wells are projected to be developed under Alternative A. The ROW development associated with 451 wells is similar to that projected for Alternatives C and D, with 449 and 451 wells, respectively. However, the ROW development associated with the 451 wells in Alternative A is 70% greater than the development associated with the 255 wells in Alternative B.

4.3.5.3.2 ALTERNATIVE B

Under Alternative B, a total of 14,961 acres of land are identified for disposal. The disposal of 14,961 acres would have a negligible impact on the net amount of land under BLM jurisdiction in the MPA or on the MPA's management. Slightly more acres of land would be disposed of under Alternative B than under Alternative A, and the same number as under as Alternatives C and D. Disposals would help accommodate resource management needs and the needs of adjacent communities. No lands were targeted for acquisition under any of the alternative. Acquisitions must meet the criteria outlined in Appendix A. In general, acquisitions would benefit the lands program by improving access and/or BLM management.

A total of 671,444 acres would be within ROW exclusion areas, and closed to surface disturbing activities under Alternative B. A non-discretionary total of 353,510 acres designated as WSAs and Wilderness contribute to this total. In addition, 266,485 acres would be excluded from ROWs in non-WSA lands with wilderness characteristics (all 32 areas), and 52,224 acres would

be closed to protect watersheds in Spanish Valley and Castle Valley. These exclusion areas would have the same impacts as described under the Common to All Action alternatives.

An additional 342,931 acres would be where surface disturbing activities are limited or are avoidance areas for new ROWs. These avoidance areas result from ACEC designation, wildlife restrictions, protection of major river corridors, scenic driving corridors, high recreation use areas, developed recreation sites, and areas with surface-use conflicts. The general nature of impacts due to excluding and avoiding ROWs is the same as described under Alternative A. However, Alternative B has the greatest area of exclusion and avoidance areas, and thus the greatest limitations on the placement of future ROWs.

Utility corridor adjustments under Alternative B would bring the total corridor area to 65,865 acres. These adjustments include the designation of two new utility corridors (the [narrow width] I-70 Utility Corridor and the Moab Canyon Utility Corridor) and the splitting of the utility corridor south of Spanish Valley into two corridors identical to the existing corridors. Implementation of these decisions would provide more avenues for placement of utilities across MPA lands than under Alternative A, but fewer opportunities than under Alternatives C and D.

Limitations on surface disturbing activities (including ROWs), would have impacts of the same nature (though not magnitude) as described under Alternative A. Alternative B has 543,751 acres with timing and controlled surface use limitation stipulations. However, with 264,344 acres available for ROWs with no restrictions, Alternative B is the most restrictive of ROWs and other land use authorizations, and thus has the most impact on the construction of future ROWs.

Minerals and energy development decisions would effect the processing of ROW grants. A total of 255 wells are projected to be developed in the MPA under Alternative B. This would require the fewest ROWs to be granted of any of the Alternatives. Alternative B would have approximately 43% less well development than Alternatives A, C, and D.

4.3.5.3.3 ALTERNATIVE C

Land disposal and acquisitions under Alternative C would be the same as under Alternatives B and D. Thus, slightly more acres of land would be disposed of under Alternative C than under Alternative A, and the same number as under Alternatives B and D. Disposals would help accommodate resource management needs and the needs of adjacent communities. Acquisitions could result in improved access and BLM management.

A total of 370,250 acres would be within ROW exclusion areas under Alternative C. A non-discretionary total of 353,520 acres designated as WSAs and Wilderness contribute to this total.

An additional 217,480 acres where surface disturbing activities are limited are avoidance areas for new ROWs. These avoidance areas result from ACEC designation, management of non-WSA lands with wilderness characteristics (47,761 acres in Beaver Creek, Fisher Towers and Mary Jane Canyon), wildlife restrictions, protection of major river corridors, high recreation use areas, developed recreation sites, and areas with surface-use conflicts. The general nature of impacts due to excluding and avoiding ROWs is the same as described under Alternative A. However,

Alternative C has less ROW exclusion and avoidance area than Alternative B, but more area than Alternatives A or D; it would therefore have corresponding limitations on the placement of future ROWs.

Utility corridor adjustments under Alternative C would bring the total corridor area to 173,099 acres. These adjustments include the designation of two new utility corridors (the [moderate width] I-70 Utility Corridor and the Moab Canyon Utility Corridor). The two utility corridors south of Spanish Valley would be combined into a single corridor with 2 to 3 miles separating the two segments. This alternative would have approximately five times the acreage of utility corridor as Alternative A, two and a half times the acreage as Alternative B, and approximately 85% of the acreage as Alternative D. Thus, implementation of these decisions would provide more avenues for placement of utilities across MPA lands than under Alternatives A and B, but fewer opportunities than under Alternative D.

Limitations on surface disturbing activities (including ROWs) would have impacts of the same nature (though not magnitude) as described under Alternative A. Alternative C has 806,994 acres where restrictions would be imposed on development and operation of ROWs. However, with 427,273 acres available for ROWs with no restrictions, Alternative C is less restrictive on ROWs or other land use authorizations than Alternative B but more restrictive than Alternative A or Alternative C, and would have corresponding impacts on the construction of future ROWs.

Alternative C is less restrictive of surface disturbing activities than Alternative B, but more restrictive than Alternatives A or D. The processing of ROW grants in support of 432 wells under Alternative C would be similar to Alternatives A and D, and greater than under Alternative B.

4.3.5.3.4 ALTERNATIVE D

Land disposal and acquisitions under Alternative D would be the same as under Alternatives B and C. Thus, slightly more acres of land would be disposed of under Alternative D than under Alternative A, and the same number as under Alternatives B and C. Disposals would help accommodate resource management needs and the needs of adjacent communities. Acquisitions could result in improved access and BLM management.

In addition to the non-discretionary 354,015 acres in WSAs and designated wilderness that are exclusion areas, an additional 84,772 acres where surface disturbing activities are limited are avoidance areas for new ROWs. These avoidance areas result from protection of major river corridors, and areas with surface-use conflicts. The general nature of impacts due to excluding and avoiding ROWs is the same as described under Alternative A. However, Alternative D has less ROW exclusion and avoidance areas than Alternatives B and C, but more area than Alternative A; it would therefore have corresponding limitations on the placement of future ROWs.

Utility corridor adjustments under Alternative D would bring the total corridor area to 204,168 acres. These adjustments include the designation of two new utility corridors (the [wide width] I-70 Utility Corridor and the Moab Canyon Utility Corridor). The I-70 Utility Corridor under this

alternative would differ from the same corridor under Alternative C in that the corridor would be twice as wide as in Alternative C. As with Alternative C, the two utility corridors south of Spanish Valley would be combined into a single corridor with 2 to 3 miles separating the two segments under Alternative D. Implementation of these decisions would provide the most avenues for placement of utilities across MPA lands of any of the alternatives.

Limitations on surface disturbing activities, including ROWs, would have impacts of the same nature (though not magnitude) as described under Alternative A. Alternative D has 590,442 acres where restrictions would be imposed on the development and operation of ROWs. However, with 797,031 acres available for ROWs with no restrictions, Alternative D is less restrictive on ROWs than Alternative B and Alternative C, but more restrictive than Alternative A. It would therefore have corresponding impacts on the construction of future ROWs.

In general, Alternative D is less restrictive of surface disturbing activities than Alternatives B and C, but more restrictive than Alternative A.

The processing of ROW grants in support of 448 wells under Alternative D would be similar to Alternatives A and C, and greater than under Alternative B.

4.3.6 LIVESTOCK GRAZING

This section discusses impacts to livestock grazing from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning livestock grazing are described in Chapter 3. Impacts on resources and resource uses resulting from implementation of the livestock grazing program are discussed in those particular resource sections of this chapter. Impacts on livestock grazing activities are generally the result of activities that affect forage levels. Conducting vegetation treatments would likely have the greatest effect on livestock grazing, as such treatments could increase vegetation production and forage available for livestock. Activities that result in surface disturbance (e.g., mineral development, ROW construction, and recreation) or management of resources that results in limiting surface disturbance (e.g., fish and wildlife, vegetation, water resources, soil resources, and visual resources) would also impact livestock grazing by affecting forage levels. Management of fire would affect livestock grazing by either preserving or increasing available forage for livestock over the long term.

The analysis is based on the following assumptions:

- Livestock grazing will be managed in accordance with the Standards for Rangeland Health and Guidelines for Grazing Management for BLM Lands in Utah.
- Livestock grazing will occur throughout the majority of the decision area.
- In the short term, actual forage use in the decision area may increase due to improving range condition and range recovery from recent drought. Over the long-term, forage demand may continue at historic levels.

Under all alternatives, there are no measurable impacts to livestock grazing from the following resources: air quality, human health and safety, paleontology, special designations (Areas of

Critical Environmental Concern, National Historic Trail, Wild and Scenic Rivers, Wilderness), visual resources, and woodlands management. Therefore, the impacts of management actions applicable to these resources will not be further analyzed.

4.3.6.1 Impacts Common to All Alternatives

Grazing practices would be modified if a grazing allotment fails to meet any of the BLM's Utah Standards for Rangeland Health (see Appendix Q), where it is determined that livestock grazing management practices are a significant factor in this failure. Modifications could include a change in stocking rate, kind of livestock, season of use, length of season, temporary closures, or any combination of these. These modifications could mean a temporary or permanent loss of acres or AUMs available to livestock for grazing in order to repair or rehabilitate an area, and to progress towards meeting the Standards for Rangeland Health.

Data collected from rangeland monitoring studies would assist the Field Manager in the decision of whether or not to restrict livestock access to an area. These kinds of closures, although they cause a temporary loss of accessible forage, are implemented with the goal of restoring the area so that it can continue to support grazing and other resource uses.

Under all alternatives, certain allotments could undergo season-of-use changes to facilitate grazing management while maintaining rangeland health standards. Changes in season of use do not affect forage, but they do impact the timing of its availability.

Livestock grazing would not be permitted in the following areas under all alternatives (see Table 4.27): Poison Spider (Arth's Pasture Allotment), Between the Creeks Allotment, Castle Valley allotment, along the Colorado River between Hittle and to the North of Dewey Bridge, along Highway 128 from 191 to Castle Valley Road, along U.S. 191 from Moab to Highway 313, along Highway 279, Kane Spring Canyon between the open valley and the Colorado River, North Sand Flats Allotment, and South Sand Flats Allotment. The reduction in acreage available to livestock associated with these actions will be compared below. It was determined that the rationale provided and the analyses conducted under the NEPA documents and Plan Amendment which rendered these areas not available for grazing were still valid.

Table 4.27. Acres and AUMs of Forage Not Available to Grazing under All Alternatives

Exclosure	Allotment(s)	Acreage	AUMs
Arth's Pasture portion	Arth's Pasture	7,634	425
Between the Creeks	Between the Creeks	3,960	221
North Sand Flats	North Sand Flats	18,246	798
South Sand Flats	South Sand Flats	10,209	592
Castle Valley	Castle Valley	6,074	190
Along the Colorado River between Hittle and to north of Dewey Bridge	Professor Valley	400	0
Along Highway 128 from 191 to Castle Valley Road; along U.S. 191 from Moab to Highway 313; along Hwy. 279	None	1,139	0

Table 4.27. Acres and AUMs of Forage Not Available to Grazing under All Alternatives

Exclosure	Allotment(s)	Acreage	AUMs
Kane Spring Canyon between the open valley and the Colorado River	Kane Creek Springs	558	0
Total		**48,220**	**2,226**

All actions would be the same as those defined in the 1985 RMP with the exceptions of laws, regulations, and policies enacted since 1985 that affect management of the resources under all alternatives. Actions common to all alternatives that would affect livestock grazing by directly decreasing or increasing acres and AUMs available to livestock are as follows:

- Wildfires would be allowed to burn according to the parameters of the Fire Management Plan unless they threaten Wildland-Urban Interface (WUI) areas, threatened, endangered, or special status species, high priority sub-basins or watersheds, cultural resources and/or cultural landscapes, or sensitive ecosystems. If an area does not have any of the above resources, it may be allowed to burn. If a wildfire occurs on rangeland, it may result in a temporary loss of acres available to livestock. BLM guidelines usually require a burned area to be closed to livestock for a minimum of one complete grazing season after a fire or until adequate vegetation rehabilitation is complete (BLM 1997a).
- Any disposals, exchanges, or acquisitions of public rangelands could change acres available for livestock grazing.
- Construction of any new wind, solar or communication sites would result in a temporary loss of acres and AUMs during construction and a permanent loss where the structure is sited.
- Surface disturbing activities due to minerals extraction could lead to temporary and long term losses of acres accessible for livestock grazing.
- Grazing would not be allowed on developed recreation sites. New recreation sites to be developed under this RMP would be excluded from grazing, in accordance with current management practices.
- Construction of new roads or cross country OHV travel could decrease acres and AUMs available for livestock.
- Since livestock grazing can have deteriorative impacts on riparian ecosystems (Armour et al. 1994), " … it may be necessary to temporarily restrict livestock use on riparian areas determined to be 'Functioning at Risk' and in a static or downward trend or 'Not Functioning'." In these cases, restrictions might be implemented to help the recovery of the site, meaning a temporary loss of acres available to livestock through seasonal restrictions, closures, and/or forage utilization limits.
- Any actions, including improper grazing, that compromise water or soil quality in sensitive areas would be avoided. Improper livestock grazing can adversely alter ecosystems by increasing soil compaction, disturbing soil, and increasing soil erosion (Belsky and Blumenthal 1997), and therefore all uses would be managed to minimize and mitigate damage to soils. Grazing would be managed to minimize impacts to saline soils and reduce salinity in the Colorado River drainage in the following allotments: Athena, Cisco, Cisco

Mesa, Crescent Canyon, Highland, Monument Wash, and Thompson Canyon. This could lead to a decrease in acres available to livestock through seasonal restrictions or closures.

- Rangelands that have been reseeded and mechanically treated would be ungrazed for a minimum of two complete growing seasons following treatment. This could lead to a decrease in acres available to livestock through temporary closures of allotments following vegetation treatments.
- In general, when livestock grazing threatens to damage the habitats of special status species and species that are listed, or proposed for listing, or candidates for listing under the Endangered Species Act, changes would be made to grazing schedules or acreage available to livestock.
- Construction of any new range improvements to benefit wildlife, such as precipitation catchments or development of new springs, would reduce acres by the amount of rangeland surface area replaced. However, they could increase the long-term available forage for livestock.
- Any future proposal for a change in kind of livestock from cattle to sheep in Rocky Mountain or desert bighorn sheep habitat would be denied. This would have no impact in acres available to cattle.
- The noise, dust, and human presence associated with any type of construction activity could also temporarily decrease the acreages or AUMs, although the degree to which these disturbances would affect livestock would be difficult to gauge.
- If an allotment occurs in recognized Rocky Mountain or desert bighorn sheep habitat, a change in class of livestock from cattle to sheep would not be authorized. Sheep can transmit diseases such as pneumonia to native bighorn sheep, which is thought to have caused high numbers of bighorn fatalities (Foreyt and Jessup 1982; Jessup 1985). Forage and water competition by livestock also creates stress to bighorn sheep, and all such interactions would be avoided (Desert Bighorn Council Technical Staff 1990).

4.3.6.2 ALTERNATIVE A

The 48,220 acres (and 2,226 AUMs) listed above under Actions Common to All Alternatives would remain not available for grazing under this alternative. Table 4.28 lists additional areas and allotments that would not be available for grazing under Alternative A.

78,612 additional acres would not be available for grazing, making a total of 126,832 acres and 4,168AUMs are not available for grazing under Alternative A (Please see Map 2-4-A-Areas Not Available for Livestock Grazing-Alternative A).

These exclusions lead to a total of 1,695,621 acres available for livestock grazing under this alternative (93.0% of total BLM lands in the MPA), and approximately 107,071 AUMs (96.2% of total current AUMs of forage available).

Table 4.28. Acres and AUMs of Forage Not Available to Grazing under Alternative A

Exclosure	Allotment(s)	Acreage	AUMs
Bogart	Bogart	14,744	209
Cottonwood	Cottonwood	27,193	900
Diamond	Diamond	18,620	588
Pear Park	Pear Park	14,201	200
Spring Creek	Spring Creek	1550	45
Beaver Creek upper drainage	Beaver Creek	2,304	0
Total		**78,612**	**1,942**

4.3.6.2.1 Impacts of Soils/Watershed Management Decisions on Livestock Grazing

Livestock grazing on portions of allotments with saline soils would be adjusted to reduce impacts on highly saline soils and reduce salinity in the Colorado River drainage. These changes could decrease the amount of acres available to livestock.

4.3.6.2.2 Impacts of Travel Management Decisions on Livestock Grazing

Areas open to cross country OHV travel would result in loss of vegetation available for livestock grazing. In this alternative, 620,212 acres are open to cross country travel, possibly resulting in the destruction of forage.

4.3.6.2.3 Impacts of Vegetation Management Decisions on Livestock Grazing

Land treatments on 11 allotments (see Alternatives Matrix) would be implemented to increase available forage by 8514 AUMs to allow for increased use by livestock and wildlife (split evenly where both are present). Prescribed fire and seeding would be implemented on approximately 14,149 acres for the same purpose increasing AUMs by approximately 1,700 for livestock and wildlife. These vegetation treatments would cause a temporary reduction in the number of acres available to livestock, as it is necessary to leave treated rangelands ungrazed for a minimum of two complete growing seasons. However, these treatments could result in an increase in available forage for livestock and future increases in acres available to livestock.

4.3.6.2.4 Impacts of Wildlife Management Decisions on Livestock Grazing

To improve pronghorn habitat grazing could be excluded from May 15 through June 20 or during extreme snow conditions. Changes in season of use could be made on fawning grounds to reduce disturbance to the pronghorn.

Livestock grazing in pronghorn fawning areas would be excluded from May 1 till June 30 in the Hatch Point HMP. Changes in season of use, number of livestock (27% reduction), change in livestock class from sheep to cattle, fencing, seeding, and rest/rotation would be recommended to improve pronghorn habitat. Rest/rotation would be implemented on the three pastures of the

Hatch Point Allotment. These changes to grazing management could reduce acres available to livestock.

Livestock adjustment techniques would be implemented on Horsethief Point, Spring Canyon Bottom, and Ten-Mile Point allotments to improve or maintain bighorn sheep habitat. This could mean a change in the number of acres available to livestock.

4.3.6.3 ALTERNATIVE B

The 48,220 acres (and 2,226 AUMs) listed above under Impacts Common to All Alternatives would remain not available for grazing under this alternative. Table 4.29 lists additional areas and allotments that would be not available for grazing under Alternative B.

Table 4.29. Acres and AUMs of Forage Not Available to Grazing under Alternative B

Exclosure	Allotment(s)	Acreage	AUMs
Bogart	Bogart	14,744	209
Cottonwood	Cottonwood	27,193	900
Diamond	Diamond	18,620	588
Pear Park	Pear Park	14,201	200
Spring Creek	Spring Creek	1,550	45
Beaver Creek upper drainage	Beaver Creek	2,309	0
Professor Valley	Professor Valley	18,966	378
Ida Gulch	Ida Gulch	3,612	112
River	River	386	7
Mill Creek	Mill Creek	3,921	137
Total		**105,502**	**2576**

Thus, an additional 105,502 acres would be not be available for grazing in Alternative B, making a total of 153,722 acres and 4,802 AUMs not available for grazin (Map 2-4-B-Areas Not Available for Livestock Grazing-Alternative B). About 106,437 AUMs remain available for grazing under Alternative B.

For purposes of analysis, Table 4.30 shows the following areas could also be unavailable for grazing under this alternative.

These decisions (excluding the riparian acres and AUMs) lead to a total of 1,668,732 acres available for livestock grazing under this alternative (91.6% of the MPA), and 106,437 AUMs of forage (95.7% of current available forage), both measurements being similar to those under Alternative A.

Table 4.30. Riparian Acres Not Available for Grazing and AUMs of Forage under Alternative B[1]

Exclusion	Allotment(s)	Acreage	AUMs
Sevenmile Canyon*	Dalton Wells, Arth's Pasture, Big Flat/Tenmile	459	2
Hatch Wash *	Hatch Point	476	10
East Coyote Wash *	Lisbon, East Coyote	391	56
Kane Springs	Kane Springs Canyon, Behind the Rocks	746	21
Hatch Wash	Hatch Point	476	10
Lower Gray Canyon*	Rattlesnake	1,628	84
Riparian areas in Mill Creek Canyon*	Mill Creek	42	1
Day Canyon*	Potash	22	1
Tenmile Wash*	Tenmile Point	434	18
Total		**4,422**	**203**

[1]Acreages are for BLM land only.

*Grazing permits have not been authorized previously in the Pear Park and Spring Creek allotments, and therefore, estimations for available forage in AUMs are not available.

4.3.6.3.1 Impacts of Minerals Management Decisions on Livestock Grazing

Under Alternative B, it is predicted that 426 acres of land would be disturbed annually due to minerals extraction. This is 253 fewer acres than Alternative A and, similar to Alternative A, represents a negligible decrease in the total forage available in the MPA.

4.3.6.3.2 Impacts of Non-WSA Lands with Wilderness Characteristics Management Decisions on Livestock Grazing

Under Alternative B, 266,485 acres in 32 areas would be managed to protect their wilderness characteristics values. Livestock developments required through Standards and Guides assessments would be required to meet VRM II objectives as well as the naturalness criteria for non-WSA lands with wilderness characteristics. This could preclude development of certain surface disturbing rangeland projects, or require placement outside the wilderness characteristics areas.

4.3.6.3.3 Impacts of Riparian Management Decisions on Livestock Grazing

Utilizing Standards for Rangeland Health, the following portions of allotments could be not available for grazing under this alternative, in addition to those listed in Alternative A: Ten Mile from Dripping Springs to the Green River, Day Canyon, Mill Creek, Seven Mile Canyon, East Coyote, Cane Springs, Lower Gray Canyon, and Hatch Wash. Managed livestock grazing in all riparian areas would be allowed, although riparian areas would be managed to meet PFC.

This could reduce the numbers of acres available to livestock grazing under Alternative B by 4,422 acres and 203 AUMs as compared to Alternative A.

4.3.6.3.4 Impacts of Soils/Watershed Management Decisions on Livestock Grazing

Under Alternative B, some sites could undergo season-of-use changes in order to minimize impacts to saline soils.

Grazing systems and AMPs would be used to minimize impacts to saline soils and reduce salinity in the Colorado River drainage in the following allotments: Agate, Big Flat-Ten Mile, Cisco Mesa, Corral Wash, Crescent Canyon, Floy Creek, Harley Dome, Highlands, and San Arroyo. These new AMPs may reduce acreage available to livestock if site closures are determined to be necessary.

4.3.6.3.5 Impacts of Travel Management Decisions on Livestock Grazing

Areas open to cross country OHV travel would result in loss of vegetation available for livestock grazing. In this alternative, 0 acres are open to cross country travel. This action could result in potential increases in forage.

4.3.6.3.6 Impacts of Vegetation Management Decisions on Livestock Grazing

Approximately 46,307 acres of vegetation treatments would be maintained to increase available forage. This is 20,818 acres (31%) less than Alternative A and is the same as Alternatives C and D. Vegetation treatments under this alternative would be used primarily to benefit wildlife.

The areas set aside to be treated may be unavailable for grazing temporarily, but improvements to the rangeland may result in more acres available for grazing. This would be especially likely if an area is rehabilitated to the point of meeting the Standards for Rangeland Health where previously it was not available for grazing due to failing to meet the standards. However, these treated areas would not necessarily lead to an increase in acres available for livestock. Potential changes in forage available for livestock would be analyzed at the project implementation level with site-specific NEPA.

4.3.6.3.7 Impacts of Wildlife Management Decisions on Livestock Grazing

Using Standards for Rangeland Health, spring livestock use could be limited on 188,975 acres on allotments within crucial pronghorn habitat in the Cisco Desert to encourage forb production. For purposes of analysis, this could lead to a total loss of 633 days (out of 1,691 total), or roughly a 37% decrease in livestock season of use in this area in comparison to Alternative A.

Using Standards for Rangeland Health, pronghorn fawning areas in the Hatch Point HMP area could not be grazed from May 1 until June 30.

For purposes of analysis, this could lead to a total loss of 86 days (out of 605 total), or roughly a 14.2% decrease in livestock season of use in this area in comparison to Alternative A.

Using Standards for Rangeland Health livestock utilization could be adjusted to protect desert bighorn sheep lambing areas, on North River and Taylor Allotments (Dry Mesa Pasture).

For purposes of analysis, this could lead to a total loss of 137 days (out of 712 total), or roughly a 19.2% decrease in livestock season of use in this area in comparison to Alternative A.

Management of rangeland in the 458,242 acres of Rocky Mountain bighorn sheep habitat from the Green River to the Colorado border would include improving or maintaining habitat and vegetative conditions to benefit the bighorn sheep while maintaining or improving the overall ecological condition of the area. Conversion of sheep to cattle on allotments that are in the 458,242 acres of managed Rocky Mountain bighorn sheep habitat would be supported. This action would not result in overall AUM reduction, but would be a loss of opportunity for ranchers who graze domestic sheep.

4.3.6.4 ALTERNATIVE C

The 48,220 acres (and 2,226 AUMs) listed above under Actions Common to All Alternatives would remain not available for grazing under this alternative (see Table 4.27). Table 4.31 lists additional areas and allotments that would not be available for grazing under Alternative C.

Table 4.31. Additional Acres and AUMs of Forage Not Available to Grazing under Alternative C

Exclosure	Allotment(s)	Acreage	AUMs
Bogart	Bogart	14,744	209
Cottonwood	Cottonwood	27,193	900
Diamond	Diamond	18,620	588
Portions of Professor Valley, Ida Gulch, and River	Professor Valley, Ida Gulch, River	1,467	0
Mill Creek	Mill Creek	3,921	137
Total		**65,945**	**1,834**

Thus, an additional 65,945 acres would not be available for grazing, making a total of 114,234 acres and 4,060 AUMs not available for grazing under Alternative C (Map 2-4-C-Areas not available for livestock grazing under Aternative C).

Table 4.32 shows the riparian areas that could be unavailable for grazing under this alternative.

These decisions (excluding the riparian acres and AUMs) lead to a total of 1,708,294 acres available for livestock grazing under this alternative (93.8% of the total MPA), and 107,179 AUMs (96.4% of current estimated forage amounts), both numbers being similar to Alternative A totals.

Table 4.32. Acres Unavailable for Grazing and AUMs of Forage under Alternative C

Exclusion	Allotment(s)	Acreage	AUMs
Seven Mile Canyon*	Dalton Wells, Arth's Pasture, Big Flat/ Tenmile	459	2
East Coyote Wash*	East Coyote, Lisbon	391	56
Riparian areas in Mill Creek canyon*	Mill Creek	42	1
Day Canyon*	Potash	22	1
Tenmile Wash, downstream from Dripping Springs*	Tenmile Point	434	18
Total		**1,169**	**78**

*These areas are considered for restriction using Standards for Rangeland Health.

Management decisions would be the same as for Alternative A, with the exceptions outlined in the sections below.

4.3.6.4.1 Impacts of Minerals Management Decisions on Livestock Grazing

Under Alternative C, it is predicted that 701 acres of land would be disturbed annually due to minerals extraction. This is 22 more acres than Alternative A (3.3% increase), but still less than 1% of the total lands in the MPA.

4.3.6.4.2 Impacts of Non-WSA Lands with Wilderness Characteristics Management Decisions on Livestock Grazing

Under Alternative C, 47,761 acres in Beaver Creek, Fisher Towers and Mary Jane Canyon non-WSA lands with wilderness characteristics would be managed to protect their wilderness characteristics values. Livestock developments required through Standards and Guides assessments would be required to meet VRM II objectives as well as the naturalness criteria for non-WSA lands with wilderness characteristics. This could preclude development of certain surface disturbing rangeland projects, or require placement outside the wilderness characteristics areas.

4.3.6.4.3 Impacts of Riparian Management Decisions on Livestock Grazing

The same riparian areas would be available for grazing as under Alternative B, except Lower Gray Canyon, Kane Springs and Hatch Wash, which would remain available. This is 1,169 more riparian acres (and 78 AUMs) potentially not available for grazing than under Alternative A.

4.3.6.4.4 Impacts of Soils/Watershed Management Decisions on Livestock Grazing

Grazing systems would be used and AMPs would be developed to minimize impacts to saline soils in the following allotments: Agate, Athena, Big Flat – Ten Mile, Cisco, Cisco Mesa, Coal Canyon, Corral Wash, Crescent Canyon, Floy Creek, Harley Dome, Highlands, Horse Canyon,

Little Grand, Lone Cone, Monument, San Arroyo. This could result in a temporary decrease in acres available to livestock.

4.3.6.4.5 Impacts of Travel Management Decisions on Livestock Grazing

Areas open to cross country OHV travel would result in loss of vegetation available for livestock grazing. In this alternative, 1,866 acres are open to cross country travel; forage could be affected on this acreage.

4.3.6.4.6 Impacts of Vegetation Management Decisions on Livestock Grazing

The same amount of vegetation treatments would be maintained as outlined under Alternatives B and D. The treatments would be used to benefit wildlife and livestock equally.

4.3.6.4.7 Impacts Wildlife Management Decisions on Livestock Grazing

Spring grazing would be adjusted on a case-by-case basis on 188,975 acres on allotments within crucial pronghorn habitat in the Cisco Desert to encourage forb production. These allotments include Athena, Cisco, Cisco Mesa, Harley Dome, San Arroyo, and Corral Wash.

Where applicable, a rest/rotation of pasture or other grazing management systems would be developed in allotments within crucial pronghorn habitat to encourage forb production prior to fawning. Change in livestock class from sheep to cattle, fencing, seeding and rest/rotation to improve habitat would be encouraged.

To protect desert bighorn sheep lambing areas, Standards for Rangeland Health would be employed on the North River and Taylor allotments (Dry Mesa Pasture) For purposes of analysis, this leads to a total loss of 92 days (out of 712 total), or roughly a 12.9% decrease in livestock season of use in this area in comparison to Alternative A.

Management of rangeland in 310,726 acres of Rocky Mountain bighorn sheep habitat from the Green River to the Colorado border would include improving or maintaining habitat and vegetative conditions to benefit the bighorn sheep while maintaining or improving the overall ecological condition of the area. Conversion of sheep to cattle on allotments in 310,726 acres of managed Rocky Mountain bighorn sheep habitat would be supported. Once conversion occurs, reconversion (from cattle to sheep) would not be allowed. This action would not result in overall AUM reduction, but would be a loss of opportunity for ranchers who graze domestic sheep.

4.3.6.5 Alternative D

The 48,220 acres (and 2,226 AUMs) listed above under Actions Common to All Alternatives would remain not available for grazing under this alternative. Table 4.33 lists additional areas and allotments that would not be available for grazing under Alternative D.

Table 4.33. Additional Acres and AUMs of Forage Not Available to Grazing under Alternative D

Exclosure	Allotment(s)	Acreage	AUMs
Mill Creek	Mill Creek	3,921	137
Total		**3,921**	**137**

Thus, an additional 3,921 acres would not be available for grazing, making a total of 52,141 acres and 2,363 AUMs not available for grazing under Alternative D (Map 2-4-D-Areas Not Available for Livestock Grazing - Alternative D).

These exclusions lead to a total of 1,770,314 acres available for livestock grazing under this alternative (97.1% of the MPA) and 108,876 AUMs of forage (97.9% of estimated totals in the MPA), which is the most amount acreage and AUMs of any alternative.

4.3.6.5.1 Impacts of Minerals Management Decisions on Livestock Grazing

It is predicted that 743 acres of land would be disturbed annually due to minerals extraction under Alternative D. This is less than 1% of the MPA and is virtually identical to the total percent of lands that would be impacted under Alternative A.

4.3.6.5.2 Impacts of Soils/Watershed Management Decisions on Livestock Grazing

Grazing systems would be managed to minimize impacts to saline soils and reduce salinity in the Colorado River drainage in the following allotments: Athena, Cisco, Cisco Mesa, Crescent Canyon, Highland Monument Wash, Thompson Canyon. This may result in temporary decreases in acres available to livestock if site closures are determined necessary.

4.3.6.5.3 Impacts of Travel Management Decisions on Livestock Grazing

Areas open to cross country OHV travel would result in loss of vegetation available for livestock grazing. In this alternative, 3,064 acres are open to cross country travel and the forage on them would be subject to impacts.

4.3.6.5.4 Impacts of Vegetation Management Decisions on Livestock Grazing

The same amount of vegetation treatments would be maintained as outlined under Alternatives B and C. Vegetation treatments would be used primarily to benefit livestock under this alternative.

4.3.6.5.5 Impacts of Wildlife/Fisheries Management Decisions on Livestock Grazing

Using Standards for Rangeland Health, seasons of use would be adjusted to protect desert bighorn sheep lambing areas in the same areas as outlined under Alternative C.

Rangeland from the Green River to the Colorado border (194,560 acres) would be managed as Rocky Mountain bighorn sheep habitat. This management would include maintaining or improving habitat and vegetative conditions to benefit bighorn sheep while maintaining or improving the ecological condition of rangelands. Any future proposal for a change in kind of livestock from cattle to sheep in Rocky Mountain bighorn sheep habitat would be denied. This action would not result in overall AUM reduction, but would be a loss of opportunity for ranchers who graze domestic sheep.

4.3.6.6 SUMMARY OF IMPACTS

Alternative B would have the least number of AUMs available of all the alternatives followed by Alternatives A, C, and D respectively. Table 4.34 summarizes grazing exclusions by AUMs and the differences by alternatives.

Table 4.34. Total AUMs of Forage Available and Not Available to Livestock by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
AUMs Available	107,071	106,437	107,179	108,876
AUMs Not Available	4,168	4,802	4,060	2,363
Compared to A	--	+634	-108	-1805
Compared to B	-634	--	-742	-2,439
Compared to C	+108	+742	--	-1,697
Compared to D	+1,805	+2,439	+1,697	--

Correspondingly Alternative B also has the fewest number of acres available for grazing followed by Alternatives A, C, and D respectively. Table 4.35 summarizes grazing exclusions by acres.

Table 4.35. Total Acreage Available and Not Available to Livestock by Alternative[1]

	Alternative A	Alternative B	Alternative C	Alternative D
Acreage Available to Grazing	1,695,621	1,668,732	1,708,294	1,770,314
Acreage Not Available to Grazing	126,907	153,797	114,234	52,214

Average annual disturbance caused by minerals extraction would have the following impacts in terms of acres under each alternative (Table 4.36).

[1] Numbers are approximate due to GIS calculation variances.

Table 4.36. Annual Average Acres of Disturbance Due to Minerals Extraction Activities Under All Alternatives, as well as Percent of Total Planning Area

	Alternative A	Alternative B	Alternative C	Alternative D
Annual acres of disturbance	679	417	638	672
Percent of total planning area	<1.0%	<1.0%	<1.0%	<1.0%

As shown, a very small percentage of the MPA would be affected by disturbance (i.e., loss of vegetation) each year. There is very little difference in yearly average acres of disturbance between alternatives, so there would thus be very little difference in potential impacts by alternative.

4.3.7 MINERALS

This section presents the environmental consequences of resource management decisions, proposed under each of the four alternatives described in Chapter 2, upon mineral resource development. Existing conditions concerning minerals are described in Chapter 3.In accordance with BLM policy and its recognition of the National Energy Policy and Conservation Act of 2000 (EPCA), as discussed in Chapters 2 and 3, mineral resource development would be allowed throughout the MPA subject to standard lease terms unless precluded by other program prescriptions, as specified in this Draft RMP.

Stipulations would be developed in the RMP, where necessary, to mitigate the impacts of oil and gas and other mineral activity (see Appendix C). The stipulations identified in Appendix C would apply to all surface-disturbing activities, aside from the exception, modification, and waiver situations as determined by an Authorized Officer. The area-specific restrictions on surface-disturbing activities listed in Table C.1 vary by alternative and detail limits on timing, surface use, and occupancy, as well as closures, throughout the MPA. Impacts to the mineral program from these stipulations are discussed throughout this section under the applicable impacting program.

4.3.7.1 RESOURCE DECISIONS THAT WOULD HAVE NEGLIGIBLE IMPACTS ON MINERAL RESOURCE DEVELOPMENT

Negligible impacts to mineral resource development would result from air quality, cultural resources, fire, health and safety, livestock grazing, travel, or woodlands management decisions. The impacts would be negligible because maintaining air quality within NAAQS thresholds through appropriate mitigation; identifying, protecting, and preserving cultural resources, and complying with section 106; reducing wildland fire risks; reducing the risks of hazardous spills, and maintaining safety around AML sites; establishing utilization levels and applying grazing standards and guidelines; designating recreational OHV access within the planning area; and permitting woodland harvesting would not reduce the opportunities for minerals leasing or for the exploration and development of mineral resources. Therefore, the impacts of management actions for these resources or programs on mineral resource development will not be analyzed further in this section.

4.3.7.2 ASSUMPTIONS

For this analysis, it is assumed that:

- 50% of the wells drilled would be productive,
- the remaining 50% would be abandoned and reclaimed, and
- revegetation would be successful within a scope of 10 years.

In addition, the surface-disturbance associated with geophysical exploration would be successfully reclaimed within a scope of 10 years.

Most geophysical exploration would occur in the Big Flat-Hatch Point, Lisbon Valley, and Eastern Paradox RFD areas. This exploration would beneficially impact mineral resource development and production, in that it would refresh or increase the data available for making prudent mineral resource development decisions (BLM 2005f). This beneficial impact cannot be quantified further because it is not possible to predict the number of wells that would ultimately result from this exploration or to predict whether such data would remain useful as data-gathering technologies advance over the next 15 years.

The RFD prepared in anticipation of this RMP utilizes data on past and current development to predict future development for all lands in the MPA, both BLM lands and non-BLM lands (BLM 2005e, 2005f). The RFD is a hypothetical scenario which allows the discussion to focus the analysis on the potential impacts. For purposes of analysis, the average acreage of disturbance per well (including the well pad, roads, and pipelines) was estimated to be 15 acres. Therefore, 15 acres is assumed to be the projected, approximate disturbance per well under each alternative.

The percentage of all lands in the MPA determined to be administered by the BLM was 69.7% (Table 4.37). Assuming the RFD applies uniformly across all lands in the MPA, any calculations made, in conjunction with the disturbance per well number (15 acres) and the alternatives matrix in Chapter 2, can be used to estimate potential mineral resource development impacts (measured in number of wells and resulting acres of surface disturbance) on BLM lands for each alternative. It was assumed that the number of wells likely to be drilled under each alternative would be proportional to the acreage of land open for mineral resource development under that alternative. For example, if an alternative had 90% of BLM lands in the MPA open for development, it would be assumed that 90% of the RFD on BLM lands would be drilled under that alternative.

Table 4.37 shows the acreages of and predicted number of wells on BLM lands within the seven RFD development areas, which are to be the focus of this analysis and of future oil and gas development within the MPA.

Table 4.37. Baseline/RFD Acreages of Lands and Average Predicted Number of Oil and Gas Wells in the Seven RFD Areas, over 15 Years

RFD Area	Acreage		BLM% of Total	Wells	
	Total	BLM		Total	BLM
Bigflat – Hatch Point	470,133	391,395	83	60	50
Book Cliffs	326,070	255,074	78	135	105
Eastern Paradox	1,121,340	675,577	60	60	36
Greater Cisco	292,952	235,620	80	247	198
Lisbon Valley	153,916	114,494	74	75	56
Roan Cliffs	329,841	95,849	29	8	2
Salt Wash	65,246	54,526	84	15	13
TOTAL[1]	**2,759,498**	**1,822,535**	**69.7**	**600**	**459**

Due to rounding, table totals may differ from the sum of the rows above.

Using the above method, similar calculations can be made regarding impacts of geophysical exploration, in conjunction with the disturbance associated with linear miles of source line within the MPA (disturbance of 3,600 acres caused by 2,000 linear miles of source line; BLM 2005f). Table 4.38 shows the acreages for development of BLM lands throughout the MPA.

Locatable and salable mineral resource development, in conjunction with the acres of disturbance within the MPA (disturbance of 350 acres caused by locatable mineral resource development and of 390 acres caused by salable mineral resource development; BLM 2005e) will be applied uniformly across the alternatives.

Short-term and long-term impacts are discussed in the introduction to Chapter 4. Because the impact indicators for this resource are number of wells and the number of acres available for mineral resource development over the life of the RMP, short-term impacts are not distinguished from long-term impacts.

The analysis of the impacts of NSO stipulations assumes that development and production of the underlying mineral resources are administratively available by directional drilling from outside the area. The extent of current directional drilling technology is currently approximately 1 mile in this region; therefore, for this RMP, 1 mile was assumed. Because the resources underlying NSO-stipulated surfaces are more difficult and costly to extract, developers are less likely to opt to develop in NSO areas if less restrictive leases are available to them. For these reasons, NSO lands experience far less development than lands with standard lease terms and special stipulations (timing limitations and controlled surface use). Since the unit of analysis in this section is acres of disturbance, and since NSO areas would not undergo surface disturbance, NSO and closed acreage has been combined in the analysis of surface disturbance. Acreage has been divided into those lands which allow surface disturbance and those lands on which surface disturbance is not allowed, and analysis performed on those two categories.

Table 4.38. Acres of BLM Lands Available for Mineral Resource Development under Each Alternative

Resource	Alternative A	Alternative B	Alternative C	Alternative D
LEASABLE MINERAL RESOURCE DEVELOPMENT, INCLUDING OIL AND GAS				
Standard Lease Terms	1,038,344	264,344	427,273	797,031
Special Stipulations (CSU and TL)	389,605	543,751	806,994	590,442
Subtotal of Open Lands	**1,427,949**	**808,096**	**1,234,267**	**1,387,473**
No Surface Occupancy (NSO) Stipulations	38,912	342,931	217,480	84,772
Closed to Leasing*	353,293	671,444	370,250	350,219
Subtotal of Closed Lands**	**392,205**	**1,014,375**	**587,730**	**434,991**
All BLM Lands	**1,820,154**	**1,822,471**	**1,821,997**	**1,822,464**
SALABLE MINERAL RESOURCE DEVELOPMENT (MINERAL MATERIAL DISPOSAL)				
Standard Terms/Conditions	1,466,861	264,344	427,273	797,031
Special Conditions (CSU and TL)		543,751	806,994	590,442
Subtotal of Open Lands	**1,466,861**	**808,097**	**1,234,267**	**1,387,473**
NSO		342,931	217,480	84,772
Closed		671,444	370,250	350,219
Subtotal of Closed Lands**		**1,014,375**	**587,730**	**434,991**
LOCATABLE MINERAL RESOURCE DEVELOPMENT (MINERAL ENTRY)				
Open, Standard Terms/Conditions	1,389,531	268,873	427,273	797,031
Open, Special Conditions (CSU and TL)		1,120,658	962,258	592,500
Open within WSAs, Subject to IMP	353,510	353,510	353,510	353,510
Subtotal of Open Lands	**1,743,041**	**1,743,041**	**1,743,041**	**1,743,041**
Withdrawn	78,333	78,333	78,333	78,333

* More than 350,000 of these acres are closed due to WSA designation (BLM 1990, 1991c, 1995, 1999; see the IMP). WSA closures are non-discretionary and, thus, are beyond the scope of this EIS's analysis. WSA designations would continue to apply across all alternatives, including Alternative A.

** See previous paragraph. NSO and closed lands compose this subtotal.

4.3.7.3 ALTERNATIVE IMPACTS

4.3.7.3.1 IMPACTS OF LANDS AND REALTY DECISIONS ON MINERAL RESOURCE DEVELOPMENT

4.3.7.3.1.1 Impacts Common to All Alternatives

Under all alternatives, approximately 78,333 acres of withdrawals from mineral entry (or 4.3% of BLM lands) would continue as follows (see Appendix C):

- Three Rivers Withdrawal (65,037 acres)
- Westwater Withdrawals (8,096 acres)
- Black Ridge Wilderness Withdrawal (5,200 acres)

These withdrawals constitute an adverse impact that would result in fewer opportunities for locatable mineral resource development on those parcels and less production and supply of locatable mineral resources (see Section 4.3.7.3.2.1).

4.3.7.3.1.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives (i.e., excluding Alternative A), an NSO stipulation would be placed on oil and gas leasing, and other surface-disturbing activities would be precluded (see Appendix C) along the U.S. Highway 191 utility corridor within Moab Canyon and within the area of the existing withdrawals. These leasing restrictions would constitute adverse impacts compared to Alternative A. Only limited development (i.e., oil and gas production using directional drilling) would be conducted on the lands managed as NSO, which would result in a lower domestic supply of mineral resources and fewer royalties.

4.3.7.3.2 IMPACTS OF MINERAL RESOURCE DEVELOPMENT DECISIONS ON MINERAL RESOURCE DEVELOPMENT

4.3.7.3.2.1 Impacts Common to All Alternatives

Adverse impacts to mineral resource development in the MPA result from discretionary land-use restrictions (e.g., seasonal wildlife restrictions). These restrictions would increase the cost, time, and effort devoted to production of mineral resources. In addition, non-discretionary procedures (i.e., protection of special status plant and animal species) would also increase the cost, time, and effort devoted to the production of mineral resources.

<u>Impacts of Federal Leases on Non-BLM Lands</u>

Under all alternatives, the BLM controls Federal lease operations on certain lands not administered by the BLM, including:

- 141,241 acres within the Manti-La Sal National Forest, Moab Ranger District, and

- 29,678 acres on split-estate lands, of which 9,617 acres (or 0.5% of all Federally leased lands) would be subject to NSO or closed to leasing.

The impacts of administering leasing operations on these non-BLM lands within the MPA—a total of 170,919 acres—would result in a net benefit for mineral resource development, particularly of oil and natural gas, over the long term. Leasing of these non-BLM lands would result in the permitting of additional wells, which in turn would result in an increase in the domestic supply of oil and natural gas and increased royalties to the Federal government and the State of Utah. However, continued oil and gas extraction would, over time, reduce the quantities of finite fossil fuel resources in the MPA. It should be noted that these lands are considered in the RFD prepared in conjunction with this Draft RMP.

Impacts of Mineral Leasing on Mineral Resource Development

Under all alternatives, potash solution mining exploration and development may occur on approximately 50 acres in the east-central portion of the MPA (i.e., the Big Flat – Hatch Point RFD Area).

This decision would result in beneficial impacts, taking the form of small increases in the domestic supply of potash. Furthermore, the development of potash resources in this area is not expected to conflict with the development of other mineral resources, including oil and gas (even if these developments are co-located; BLM 2005e, 2005f), due primarily to the small scale of development. Thus, the net impact of this decision would be beneficial across all alternatives.

Impacts of Salable Minerals on Mineral Resource Development

Under all alternatives, over the life of the RMP, sand and gravel resource development would continue at known deposits and could disturb approximately 360 acres in close proximity to transportation corridors and communities. Development of building stone, humate, and clay resources would also continue at existing and historical deposits and would disturb approximately 10, 17, and 7 acres, respectively, adjacent to existing and historical deposits. Therefore, a total of 394 acres are expected to be disturbed due to the development of salable minerals, which in turn would result in beneficial impacts of the types described above for potash, for similar reasons. Although development of salable mineral resources may be co-located with oil and gas and other mineral resource development, mineral material disposal operations are typically discrete sites, small enough to avoid conflicts with the development of other mineral resources. Very few adverse impacts in the form of resource conflicts between development and extraction of salable and other mineral resources would be anticipated.

Impacts of Locatable Minerals on Mineral Resource Development

Approximately 1,743,041 acres of BLM land would remain open to development of locatable mineral resources (i.e., uranium-vanadium and copper) across all alternatives, and development of these mineral resources would continue during the life of the RMP at a consistent level, regardless of the alternative implemented. The impacts of any future development of locatable resources would be analyzed through site-specific NEPA when and if the project(s) are proposed.

Approximately 300 acres (about 20 acres per year) could be disturbed for uranium-vanadium resource development over the life of the plan. This continuation of uranium-vanadium resource development would result in beneficial impacts described above for potash. Oil and gas development has some potential to co-occur with uranium-vanadium development. However, uranium-vanadium mining operations are small enough to preclude conflict or adverse impacts with oil and gas development at the planning area-wide scale (BLM 2005f).

Development of copper resources is expected to continue and expand slightly over the life of the RMP. The newly initiated Lisbon Valley Copper project—involving the Centennial, Sentinel, and GTO copper deposits—has begun copper production and is anticipated to utilize and then reclaim 1,103 acres over the life of the RMP. This multi-year copper resource development project would result in beneficial impacts, which would take the form of an increase in the domestic supply of copper. The project is, however, within an area of high development potential for oil and gas. The project's copper development operations could eliminate some opportunities for oil and gas exploration and development because oil and gas could not be developed where it would interfere with mining operations. Exploration and drilling is anticipated in the Lisbon Valley Copper area, which would amount to approximately 25–50 acres of surface disturbance over the next 10 years. In addition, along the Salt Valley anticline, drilling and potentially open-pit mining or in situ leaching facilities may cause 20 acres of surface disturbance. All of this additional copper resource development (up to approximately 70 acres) would result in beneficial and adverse impacts of the same type as those described for the Lisbon Valley Copper project, for the same reasons.

4.3.7.3.2.2 Alternative A

Oil and Gas Resources

Approximately 1,427,949 (or 78.5%) of BLM lands within the MPA would be open for oil and gas leasing subject to standard lease terms and conditions and special stipulations (see Appendix C) within the seven RFD development areas (see Table 4.38). Based on the proportion of BLM lands open for leasing, and on the information contained in the RFD scenario (BLM 2005f), it is estimated that 451 oil and gas wells would be drilled over the life of the RMP (Table 4.39; Map 3-16). These restrictions are discussed under the resource section imposing the stipulation or closure. See the Socioeconomic analysis in this chapter (Section 4.3.12) for the projected production and revenue of oil and gas for Alternative A.

Geophysical Exploration

Under Alternative A, approximately 1,332 linear miles of source line for geophysical exploration would be conducted over the life of the RMP for the purposes outlined in Section 4.3.7.2 and would result in approximately 2,397 acres of surface disturbance over the life of the RMP. This exploration would result in beneficial impacts to mineral resource development of the same type and quality described in Section 4.3.7.2, for the same reasons (BLM 2005f).

Table 4.39. Number of Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative A, Average over 15 Years and Maximum per Year (MPY)

RFD Area	Acres of BLM Lands Open			% of BLM Lands Open	# of Predicted Wells*	
	Standard	Special	Total		15 Years	MPY**
Bigflat – Hatch Point	242,405	121,185	363,590	93	46	4
Book Cliffs	36,347	114,304	150,651	99	104	12
Eastern Paradox	428,369	99,088	527,457	95	34	4
Greater Cisco	182,272	33,440	215,712	99	196	24
Lisbon Valley	102,100	12,303	114,403	100	56	6
Roan Cliffs	6	3,144	3,150	100	2	1
Salt Wash	46,845	6,141	52,986	97	13	2
Total	**1,038,344**	**389,605**	**1,427,949**		**451**	**52**

Note: Calculations based on BLM lands only.

*Oil and natural gas wells are considered together.

**Based on the RFD (BLM 2005f), Maximum per Year (MPY) reflects the maximum development that *could* occur in *any given year* over 15 years. During most years, development per year would be less than this maximum. To find the *average* development per year, take the Average over 15 years and divide it by 15, which is the number of years projected in the RFD.

Other Leasable Resources

Under Alternative A, approximately 1,427,949 acres of BLM land would be open for the leasing of potash and salt. However, the same level of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1.

Salable Resources

Under Alternative A, approximately 1,466,861 acres of BLM land would be open to development of salable minerals. Although development could occur anywhere within this acreage, the same *level* of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1. The restrictions on salable resource development are discussed under the resource sections imposing these restrictions.

4.3.7.3.2.3 Alternative B

Oil and Gas Resources

Approximately 808,096 acres (or 44.3%) of BLM lands within the MPA would be open for oil and gas leasing subject to standard lease terms and special stipulations (see Appendix C), within the seven RFD development areas (see Table 4.38). Based on the proportion of BLM lands open for leasing under standard lease terms and special stipulations, and on the information contained in the RFD scenario (BLM 2005f), it is estimated that 264 oil and gas wells would be drilled over the life of the RMP (Table 4.40; Map 3-16; BLM 2005f). This alternative would result in a decrease of approximately 619,853 acres (or 34.1%) of BLM lands available for development and a decrease of 187 predicted oil and gas wells (or 41.4%) compared to Alternative A. The

NSO stipulations and closures for mineral resource development are discussed under the resource sections imposing the restrictions. See the Socioeconomic analysis in this chapter (Section 4.3.12) for the projected production and revenue of oil and gas for Alternative B.

Table 4.40. Number of Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative B, Average over 15 Years and Maximum per Year (MPY)

RFD Area	Acres of BLM Lands Open			% Of BLM Lands Open	# of Predicted Wells*	
	Standard	Special	Total		15 Years	MPY**
Bigflat – Hatch Point	76,845	68,081	144,926	39	19	2
Book Cliffs	23,515	72,486	96,001	63	66	7
Eastern Paradox	80,032	237,603	317,635	59	21	2
Greater Cisco	47,840	44,879	92,719	46	92	11
Lisbon Valley	89	110,766	110,855	97	54	6
Roan Cliffs	0	1,398	1,398	37	1	0
Salt Wash	36,024	8,539	44,563	82	11	1
Total	**264,345**	**543,752**	**808,097**		**264**	**29**

Note: Calculations based on BLM lands only.

*Oil and natural gas wells are considered together.

**Based on the RFD (BLM 2005f), MPY reflects the maximum development that *could* occur in *any given year* over 15 years. During most years, development per year would be less than this maximum. To find the *average* development per year, take the 15 year projection and divide it by 15, which is the number of years projected in the RFD.

Geophysical Exploration

Under Alternative B, approximately 780 linear miles of source line for geophysical exploration would be conducted over the life of the RMP for the purposes outlined in Section 4.3.7.2 and would result in approximately 1,404 acres of surface disturbance over the life of the RMP. This exploration would result in beneficial impacts to mineral resource development by providing new data for making prudent mineral resource development decisions. However, less exploration would happen under Alternative B than under Alternative A; 552 fewer miles of source line (a decrease of 41%) would be used under Alternative B compared to Alternative A.

Other Leasable Resources

Under Alternative B, approximately 808,096 acres of BLM land would be open for the leasing of potash and salt. The same level of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1.

Salable Resources

Under Alternative B, approximately 808,097 acres of BLM land would be open to development of salable minerals (a decrease of approximately 659,671 acres, or 44.9%, compared to Alternative A). Although development could occur anywhere within this acreage, the same *level* of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1. The

restrictions on salable resource development are discussed under the resource sections imposing these restrictions.

4.3.7.3.2.4 Alternative C

Oil and Gas Resources

Approximately 1,234,267 acres (or 67%) of BLM lands within the MPA would be open for oil and gas leasing subject to standard lease terms and special stipulations (see Appendix C) within the seven RFD development areas (see Table 4.38). Based on the proportion of BLM lands open for leasing under standard lease terms and special stipulations, and on the information contained in the RFD (BLM 2005f), it is estimated that 432 oil and gas wells would be drilled over the life of the RMP (Table 4.41; Map 3-16; BLM 2005f). This alternative would result in a decrease of approximately 193,682 acres (or 10%) of BLM lands available for development and a decrease of 19 oil and gas wells (or 4%) compared to Alternative A. The NSO stipulations and closures for mineral resource development are discussed under the resource sections imposing the restrictions. See the Socioeconomic analysis in this chapter (Section 4.3.12) for the projected production and revenue of oil and gas for Alternative C.

Table 4.41. Number of Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative C, Average over 15 Years and Maximum per Year (MPY)

RFD Area	Acres of BLM Lands Available			% of BLM Lands Available	# of Predicted Wells*	
	Standard	Special	Total		15 Years	MPY**
Bigflat – Hatch Point	114,903	150,323	265,226	68	34	3
Book Cliffs	37,257	113,105	150,362	99	104	12
Eastern Paradox	115,124	321,160	436,284	78	28	3
Greater Cisco	110,602	106,768	217,370	100	197	24
Lisbon Valley	10,444	103,439	113,883	100	56	6
Roan Cliffs	0	3,434	3,434	90	2	1
Salt Wash	38,943	8,765	47,708	88	11	1
Total	**427,273**	**806,994**	**1,234,267**		**432**	**50**

Note: Calculations based on BLM lands only.

*Oil and natural gas wells are considered together.

**Based on the RFD (BLM 2005f), MPY reflects the maximum development that *could* occur in *any given year* over 15 years. During most years, development per year would be less than this maximum. To find the *average* development per year, take the 15 Year Average and divide it by 15, which is the number of years projected in the RFD.

Geophysical Exploration

Under Alternative C, approximately 1,151 linear miles of source line for geophysical exploration would be conducted over the life of the RMP for the purposes outlined in Section 4.3.7.2 and would result in approximately 2,072 acres of surface disturbance over the life of the RMP. This exploration would result in beneficial impacts to mineral resource development by providing new data for making prudent mineral resource development decisions. However, less exploration

would happen under Alternative C than under Alternative A; 181 fewer miles of source line (a decrease of 14%) would be used under Alternative C compared to Alternative A.

Other Leasable Resources

Under Alternative C, approximately 1,234,267 acres of BLM land would be open for the leasing of potash and salt. However, the same level of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1.

Salable Resources

Under Alternative C, approximately 1,234,267 acres of BLM land would be open to development of salable minerals (a decrease of approximately 193,682 acres, or 10.6%, compared to Alternative A). Although development could occur anywhere within this acreage, the same *level* of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1. The restrictions on salable resource development are discussed under the resource sections imposing these restrictions.

4.3.7.3.2.5 Alternative D

Oil and Gas Resources

Approximately 1,387,473 acres (or 76%) of BLM lands within the MPA would be open for oil and gas leasing subject to standard lease terms and special stipulations (see Appendix C) within the seven RFD development areas (see Table 4.38). Based on the proportion of BLM lands open for leasing under standard lease terms and special stipulations and on the information contained in the RFD (BLM 2005f), it is estimated that 448 oil and gas wells would be drilled over the life of the RMP (Table 4.42; Map 3-16; BLM 2005f). This alternative would result in a decrease of approximately 40,476 acres (or 2.8%) of BLM lands available for development and a decrease of 3 oil and gas wells (or 0.7%) compared to Alternative A. The NSO stipulations and closures for mineral resource development are discussed under the resource sections imposing the restrictions. See the Socioeconomic analysis in this chapter (Section 4.3.12) for the projected production and revenue of oil and gas for Alternative D.

Geophysical Exploration

Under Alternative D, approximately 1,294 linear miles of source line for geophysical exploration would be conducted over the life of the RMP for the purposes outlined in Section 4.3.7.2 and would result in approximately 2,329 acres of surface disturbance over the life of the RMP. This exploration would result in beneficial impacts to mineral resource development of the same type and quality described in Section 4.3.7.2, for the same reasons (BLM 2005f). However, less exploration would happen under Alternative D than under Alternative A; 38 fewer miles of source line (a decrease of 2.9%) would be used under Alternative D compared to Alternative A.

Table 4.42. Number of Predicted Oil and Gas Wells on BLM Lands within RFD Areas under Alternative D, Average over 15 Years and Maximum per Year (MPY)

RFD Area	Acres of BLM Lands Available			% of BLM Lands Available	# of Predicted Wells*	
	Standard	Special	Total		15 Years	MPY**
Bigflat – Hatch Point	242,777	104,200	346,977	89	44	4
Book Cliffs	42,733	109,467	152,200	100	105	12
Eastern Paradox	241,991	259,192	501,183	90	32	4
Greater Cisco	194,535	22,902	217,437	100	197	24
Lisbon Valley	25,261	88,650	113,911	100	56	6
Roan Cliffs	0	3,746	3,746	98	2	1
Salt Wash	49,734	2,285	52,019	95	12	2
Total	**797,031**	**590,442**	**1,387,473**		**448**	**52**

Note: Calculations based on BLM lands only.

*Oil and natural gas wells are considered together.

**Based on the RFD (BLM 2005f), MPY reflects the maximum development that *could* occur in *any given year* over15 years. During most years, development per year would be less than this maximum. To find the *average* development per year, take the 15 year average and divide it by 15, which is the number of years projected in the RFD.

Other Leasable Resources

Under Alternative D, approximately 1,387,473 acres of BLM land would be open for the leasing of potash and salt. However, the same level of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1.

Salable Resources

Under Alternative D, approximately 1,387,473 acres of BLM land would be open to development of salable minerals (a decrease of approximately 40,476 acres, or 2.8%, compared to Alternative A). Although development could occur anywhere within this acreage, the same *level* of development is projected for all alternatives, as mentioned in Section 4.3.7.3.2.1. The restrictions on salable resource development are discussed under the resource sections imposing these restrictions.

4.3.7.3.3 Impacts of Non-WSA Lands with Wilderness Characteristics Management Decisions on Mineral Resource Development

4.3.7.3.3.1 Alternative A

Under Alternative A, no acres of lands with wilderness characteristics are to be managed to protect these characteristics, resulting in a closure of 0% of all BLM lands to salable and leasable mineral resource development. No impacts to mineral development would result in the form of lower supply of mineral resources and fewer royalties.

4.3.7.3.3.2 Alternative B

Under Alternative B, 266,485 acres of lands with wilderness characteristics (in 32 areas) would be managed to protect these characteristics. This would result in a closure of approximately 14.6% of all BLM lands to salable and leasable mineral resource development. Closing these areas to leasing would preclude extraction of a) oil and gas resources in any of the 32 areas, b) coal-bed methane leasing and development in Hells Hole, Hideout Canyon, and Mexico Point, and c) potash resources in Goldbar. An estimate of oil and gas wells foregone is 41 wells within the Bookcliffs RFD area, 8 wells within the Big Flat Hatch Point RFD area and 8 wells within Eastern Paradox RFD area over the 15 year RFD scenario. An estimate of coal-bed methane wells foregone is one 5-spot well cluster over the 15 year RFD scenario.

Development of valid existing oil and gas leases on 50,516 acres within 20 of the 32 non-WSA lands with wilderness characteristics could occur, however, additional mitigation may be required to protect wilderness characteristics values.

There would be no potential for the expansion of existing salable mineral disposal sites into the Horsethief Point, Goldbar, Behind the Rocks and Mary Jane Canyon units.

Alternative B represents the greatest adverse impacts to mineral resource development due to management of lands with wilderness characteristics.

4.3.7.3.3.3 Alternative C

Under Alternative C, approximately 47,761 acres (or 2.6% of all BLM lands) in Beaver Creek, Fisher Towers and Mary Jane Canyon would be managed to protect wilderness characteristics. This would include applying a NSO stipulation for oil and gas leasing and precluding other surface disturbing activities to lands with wilderness characteristics. This would restrict development of leasable minerals (though still allow development at greater cost) and preclude the development of salable minerals. (Certain lands within the NSO areas unreachable by directional drilling would be closed to oil and gas leasing. Due to the small amount of acreage, it is not anticipated that this would affect the RFD scenario for oil and gas development.)

There would be no potential for expansion of the two sand and gravel salable mineral disposal sites on the boundary of the Mary Jane Canyon into the non-WSA lands with wilderness characteristics.

This decision would result in impacts to mineral development, but the acreage affected would be far less than Alternative B, but more than Alternatives A and D.

4.3.7.3.3.4 Alternative D

Same as Alternative A.

4.3.7.3.4 Impacts of Paleontology Decisions on Mineral Resource Development

Under all alternatives (i.e., including Alternative A), lease notices, stipulations, and other requirements would be attached to permitted activities, including mineral resource development, to prevent the degradation or destruction of paleontological resources. These additional stipulations and requirements would result in an adverse impact that would take the form of additional expenditures of time, money, and effort by mineral resource developers in completing projects within the MPA.

4.3.7.3.5 Impacts of Recreation Decisions on Mineral Resource Development

4.3.7.3.5.1 Alternative A

The designation of SRMAs in Alternative A does not limit mineral resource development, and no other special recreation management decisions are proposed under Alternative A. Therefore, no recreation-related impacts to mineral resource development would occur under Alternative A.

4.3.7.3.5.2 Alternative B

Under Alternative B, NSO stipulations would apply as follows:

- in the Goldbar/Corona Arch Hiking Focus Area (4,781 acres) of the Labyrinth Rims/ Gemini Bridges SRMA, and
- throughout the Sand Flats SRMA (6,246 acres).

These limitations on 11,027 acres would have a slight, adverse impact on mineral resource development, in the form of additional costs for individual projects associated with NSO leases in these areas, and/or in the form of less domestic supply of oil and gas and fewer royalties.

4.3.7.3.5.3 Alternative C

Impacts under Alternative C would take the same form as under Alternative B, but because the NSO stipulation would apply to 590 fewer acres under Alternative C, the magnitude of the adverse impacts to minerals would be slightly reduced from Alternative B.

4.3.7.3.5.4 Alternative D

There would be no adverse impacts to mineral resource development from recreation management decisions under this alternative because no restrictions on mineral development are proposed.

4.3.7.3.6 Impacts of Riparian Resource Decisions on Mineral Resource Development

Under all action alternatives, no surface disturbance would be allowed on lands within 100-year floodplains or within 100 m of riparian areas, public water reserves, or springs. This may result in additional costs to oil and gas developers because directional drilling would be required to access mineral resources in riparian zones. In Alternative A, some select floodplains within the MPA are identified for protection; however, the acreage is less than under the action alternatives, and the additional costs to oil and gas developers because of directional drilling would be less under Alternative A.

4.3.7.3.7 Impacts of Soils and Watershed Decisions on Mineral Resource Development

4.3.7.3.7.1 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, oil and gas developers would be required to follow the Guidance for Pipeline Crossings (see Appendix H), including conducting hydraulic analysis during the design phase to eliminate potential environmental degradation. This may result in adverse impacts to oil and gas development, as it would potentially increase the up-front cost of specific development projects.

Under all action alternatives, any mineral resource development occurring in fragile soils (see Chapter 2 and Section 3.13.4.3, Fragile Soils) would require BMPs and applicable mitigation measures to minimize impacts. Requiring a project proponent to comply with BMPs and mitigation measures would result in adverse impacts to mineral resource development, as it may increase the cost and time required to fully implement a mineral resource exploration or development project in fragile soils.

Under all action alternatives, a controlled surface use stipulation (see Appendix C) would be applied on all slopes upwards of 30% throughout the MPA, and an additional timing limitation stipulation would be put into effect on steep slopes in the Book Cliffs RFD Area from November 1 through April 30 (i.e., 181 days, or 50% of the year). These special stipulations would have an adverse impact upon mineral resource development, though these lands would still be open to development with the restrictions specified.

4.3.7.3.7.2 Alternative A

Under Alternative A, surface-disturbing activities would be prohibited on approximately 313,800 acres of saline soils in Mancos Shale (or 17% of all BLM lands) from November 1 through April 30 (i.e., 181 days). This timing limitation stipulation would have an adverse impact upon mineral resource development, for the reasons stated in Section 4.3.13.5.

4.3.7.3.7.3 Alternative B

Under Alternative B, the Castle Valley watershed and the Mill Creek–Spanish Valley watershed would be closed to leasing to protect the aquifers. These closures would result in adverse impacts to mineral resource development, as these lands would not yield a supply of mineral resources or royalties. Of all the alternatives, Alternative B represents the greatest impacts to mineral resource development due to the closure of these two watersheds.

Under Alternative B, surface-disturbing activities would be prohibited on approximately 330,142 acres of moderately to highly saline soils in Mancos Shale (or 18.1% of all BLM lands) from December 1 through May 31 (i.e., 182 days). This timing limitation stipulation would have an adverse impact upon mineral resource development, for reasons stated in Alternative A. Impacts would be essentially of the same magnitude as Alternative A.

Under Alternative B, a minimum of 487,917 acres of BLM lands (or 60.4% of open BLM lands) with highly limited fragile soils/slopes would be subject to surface-disturbing mineral resource development with a timing limitation or controlled surface use stipulation (see Sections 3.13, Soils and Watershed, and 4.3.13, Soils and Watershed). These particular stipulations and their attendant impacts upon mineral resource development are described in Section 4.3.7.3.7.1. Alternative B represents the smallest acreage of fragile soils/slopes available for leasing under standard lease terms and special stipulations because much of the acreage with fragile soils/slopes is closed or NSO due to other resource decisions.

4.3.7.3.7.4 Alternative C

Under Alternative C, the Castle Valley watershed and the Mill Creek–Spanish Valley watershed would be subject to NSO stipulations for leasing to protect the aquifers by allowing no drilling on the surface above them. These restrictions would result in adverse impacts to mineral resource development, as development of these lands would require directional drilling and the attendant increases in cost and effort. Alternative C thus represents fewer impacts to mineral resource development than Alternative B (which closes these aquifers to leasing), but more than Alternatives A and D.

The same timing limitation stipulation on the same moderately to highly saline soils in Mancos Shale under Alternative B would also apply under Alternative C. Impacts under Alternative C would be identical to those of Alternative B.

Under Alternative C, a minimum of 710,129 acres of BLM lands with fragile soils/slopes are open to surface-disturbing mineral resource development (or 57.5% of open BLM lands) with a timing limitation or controlled surface use stipulation (see Sections 3.13, Soils and Watershed, and 4.3.13, Soils and Watershed). These particular stipulations and their attendant impacts upon mineral resource development are described in Section 4.3.7.3.7.1. Alternative C represents a much larger acreage of fragile soils/slopes open to mineral leasing under standard lease terms and special stipulations than Alternative B because less acreage with fragile soils/slopes is closed or NSO due to other resource decisions.

4.3.7.3.7.5 Alternative D

Under Alternative D, no lease stipulations would be applied to the Castle Valley watershed or the Mill Creek–Spanish Valley watershed to protect the aquifers. Therefore, no impacts to mineral resource development in these areas would result.

No timing limitation stipulations on the moderately to highly saline soils in Mancos Shale would be applied under Alternative D. Therefore, impacts to mineral resource development would be beneficial compared to Alternative A. Of all the alternatives, Alternative D has the least restrictions regarding saline soils in Mancos Shale, and is therefore the least impacting on mineral development.

Under Alternative D, a minimum of 784,782 acres of BLM lands with fragile soils/slopes are open to surface-disturbing mineral resource development (or 56.6% of open BLM lands) with a timing limitation or controlled surface use stipulation (see Sections 3.13, Soils and Watershed, and 4.3.13, Soils and Watershed). These particular stipulations and limitations and their attendant impacts upon mineral resource development are described in Section 4.3.7.3.7.1. Alternative D is most like Alternative C in acreage and proportion; therefore, the impacts to mineral resource development would be similar to Alternative C.

4.3.7.3.8 Impacts of Special Designations Decisions on Mineral Resource Development

4.3.7.3.8.1 Impacts Common to All Alternatives

The MPA includes 11 Wilderness Study Areas (WSAs) and one Wilderness Area (WA), which together total 354,015 acres (or approximately 19% of BLM lands). WAs are closed to oil and gas leasing pursuant to the Wilderness Act, and WSAs are closed to oil and gas leasing under the Interim Management Policy for Lands under Wilderness Review (BLM 1995). These areas are also closed to salable minerals. WSAs are open to the location of mining claims for locatable minerals; WAs are withdrawn from locatable minerals, and are therefore closed to development.

WSA and wilderness designations would continue to apply across all alternatives and would remain closed to leasing due to their designation. These closures are non-discretionary and, thus, are beyond the scope of this analysis.

4.3.7.3.8.2 Alternative A

<u>ACECs</u>

In Alternative A, no ACECs are designated. However, the Negro Bill Outstanding Natural Area (1,287 acres) would continue. This area is entirely within the Negro Bill WSA, and is therefore closed to leasing and mineral development. This closure is non-discretionary and thus, is beyond the scope of this analysis.

WSRs

Under Alternative A, Colorado River Segments #1, #2, and #3 and all segments of the Dolores River are eligible. This eligibility results in 16,079 acres (or 0.8% of all BLM lands) managed as NSO. Therefore, these areas would be removed from mineral resource development except for directional drilling for oil and gas, which would add expense for individual oil and gas producers.

4.3.7.3.8.3 Alternative B

ACECs

Management of ACECs in the MFO would result in greater restrictions on mineral resource development, replacing standard lease terms or special stipulations with NSO stipulations. Under Alternative B, 610,714 acres of BLM lands would occur in ACECs (Table 4.43), all of which are subject to an NSO stipulation or closed to leasing. Since 309,599 acres (out of 610,714 acres) are automatically closed to leasing because they are located in WSAs, the remainder—301,115 acres—would be managed with an NSO stipulation as a direct result of designation of the ACECs (see Table 4.43). Therefore, for the purposes of this analysis, implementation of Alternative B represents a restriction of 16.5% of all BLM lands (301,115 acres) due to ACEC designation. ACEC designation under Alternative B would result in an adverse impact upon mineral resource development because the resources underlying NSO-designated surfaces are more difficult and costly to extract. In addition, developers are less likely to develop in NSO areas if less restrictive leases are available to them. Alternative B is more restrictive to mineral resource development than any of the other alternatives and thus would have the greatest overall adverse impact on mineral resource development.

WSRs

Under Alternative B, all WSR segments are recommended as suitable. WSR suitability recommendations, of themselves, do not impose limitations on surface disturbing activities, because limitations on surface disturbance would be imposed by other resource decisions, such as wilderness, wilderness characteristics, scenery, watershed, and the Three Rivers withdrawal. These other resource decisions would protect the outstandingly remarkable values of the WSRs.

Therefore, with the exception of VRM Class, it was not necessary to impose duplicative restrictions on mineral development as a result of WSR suitability. Suitable segments tentatively classified as Wild would be designated as VRM Class I; all other segments would be designated as VRM Class II. As a result, except for VRM Class, recommendations of suitable WSR segments would not impose direct impacts to mineral resource development under Alternative B. The protections imposed by other resources are identified in Table 4.44, Acreages of Potential ACECs that are Available to Mineral Development under Alternative B.

Table 4.43. Acreages of Potential ACECs that are Available to Mineral Resource Development under Alternative B

ACEC	Acres*			Acres in Each Lease Category			
	Total	Within WSA[1]	Outside WSA	Standard	Special	NSO	Closed
Behind the Rocks	17,848	12,983	4,865	0	0	4,865	12,983
Bookcliffs Wildlife Area[2]	302,449	247,853	54,596	0	0	28,157	274,292
Canyon Rims[3]	23,414	0	23,414	0	0	22,972	442
Cisco White-tailed Prairie Dog Complex	117,481	0	117,481	0	0	83,977	33,504
Colorado River Corridor	50,708	2,752	47,956	0	0	24,310	26,398
Cottonwood-Diamond Watershed[4]	35,042	33,218	1,824	0	0	1,824	33,218
Hwy 279 Corridor/Shafer Basin/Long Canyon	13,487	0	13,487	0	0	12,544	943
Labyrinth Canyon	8,529	0	8,529	0	0	8,529	0
Mill Creek Canyon	13,501	7,833	5,668	0	0	0	13,501
Ten Mile Wash	4,980	0	4,980	0	0	4,980	0
Upper Courthouse	11,529	0	11,529	0	0	8,480	3,049
Westwater Canyon	5,069	4,960	109	0	0	109	4,960
White Wash	2,988	0	2,988	0	0	2,988	0
Wilson Arch	3,689	0	3,689	0	0	3,689	0

1. Or with Wilderness values; always VRM I, or closed to leasing.
2. Portions of this ACEC lie within 5 WSAs.
3. Within Canyon Rims SRMA
4. Portions of this ACEC lie within 3 WSAs.

*Acreage variations may be due to GIS rounding errors

Table 4.44. Suitable Rivers and Restrictions on Mineral Development under Alternative B

Suitable River	Oil and Gas Leasing Category	Resource Imposing Oil and Gas Restriction	VRM Class
Beaver Creek	NSO	Three Rivers Withdrawal to protect scenery, recreation, wildlife, riparian; non-WSA lands with wilderness characteristics.	II
Colorado River	NSO/Closed	Three Rivers Withdrawal to protect scenery, recreation, wildlife, riparian; WSA.	I in Westwater; otherwise II
Cottonwood Creek	Closed	WSA.	I
Dolores River	NSO	Three Rivers Withdrawal.	II
Green River	NSO	Three Rivers Withdrawal.	II
Mill Creek (South Fork)	Closed	ACEC; Moab Watershed.	I
Negro Bill Creek	Closed/NSO	Three Rivers Withdrawal; WSA.	I (in WSA) and II
North Fork Mill Creek	Closed	WSA.	I
Onion Creek	NSO/Closed	Three Rivers Withdrawal; wilderness characteristics.	II
Professor Creek	NSO/Closed	Three Rivers Withdrawal; wilderness characteristics.	II
Rattlesnake Creek	Closed	WSA.	I (Desolation WSA)
Salt Wash	NSO (Three Rivers)	Three Rivers Withdrawal.	II
Thompson Creek	NSO	Wilderness characteristics.	II

4.3.7.3.8.4 Alternative C

ACECs

Under Alternative C, 63,781 acres of BLM lands would occur in ACECs (Table 4.45), all of which are subject to an NSO stipulation or closed to leasing. Since 33,218 acres (out of 63,781 acres) are automatically closed to leasing because they are located in WSAs, the remainder—30,563 acres—would be managed with an NSO stipulation as a direct result of designation of the ACECs (see Table 4.45). Therefore, for the purposes of this analysis, implementation of Alternative C represents a restriction of 1.7% of all BLM lands (30,563 acres) due to ACEC designation. ACEC designation under Alternative C would result in less of an adverse impact upon mineral resource development than it does under Alternative B, but more than Alternatives A and D.

Table 4.45. Acreages of Potential ACECs that are Available to Mineral Resource Development under Alternative C

ACEC	Acres*			Acres in Each Lease Category			
	Total	Within WSA[1]	Outside WSA	Standard	Special	NSO	Closed
Behind the Rocks	4,687	0	4,687	0	0	4,687	0
Cottonwood-Diamond Watershed[2 3]	35,042	33,218	1,824	0	0	1,824	33,218
Hwy 279 Corridor/ Shafer Basin/Long Canyon	13,487	0	13,487	0	0	13,487	0
Mill Creek Canyon	5,585	0	5,585	0	0	5,585	0
Ten Mile Wash	4,980	0	4,980	0	0	4,980	0

1. Or with Wilderness values; always VRM I, or closed to leasing.
2. Portions of this ACEC lie within 3 WSAs.
3. Same as Alternative B.

*Acreage variations may be due to GIS rounding errors.

WSRs

Impacts to mineral resource development from WSR suitability recommendations would be the same as under Alternative B, for the same reasons. Table 4.46 shows the WSR recommendations under Alternative C, and the resource imposing the restriction on mineral development.

Table 4.46. Suitable Rivers and Restrictions on Mineral Development under Alternative C

Suitable River	Oil and Gas Leasing Category	Resource Imposing Oil and Gas Restriction	VRM Class
Colorado River	NSO/Closed	Three Rivers Withdrawal to protect scenery, recreation, wildlife, riparian; WSA.	I in Westwater; otherwise II
Dolores River	NSO	Three Rivers Withdrawal.	II
Green River	NSO	Three Rivers Withdrawal.	II

4.3.7.3.8.5 Alternative D

ACECs

Under Alternative D, zero acres of BLM lands would occur in ACECs. Though management prescriptions are made for these parcels of land (e.g., leasing and VRM categories, whether to allow minerals entry, disposal, or geophysical work), none of these prescriptions is associated with an ACEC designation. Therefore, under Alternative D, special designation decisions regarding ACECs would have no impacts upon mineral development.

WSRs

Under Alternative D, none of the eligible WSR segments carried forward in this RMP would be determined suitable. Therefore, special designation decisions regarding WSRs would have no impacts upon mineral development.

4.3.7.3.9 Impacts of Special Status Species Decisions on Mineral Resource Development

4.3.7.3.9.1 Impacts Common to All Alternatives

All alternatives require some degree of spatial or temporal limitation on surface-disturbing activities so as to protect special status species and their important habitats. In the case of mineral resource development, specific conditions of approval or lease terms are often required in order to mitigate the adverse impacts of development activities on special status species.

Standard lease terms and conditions (lease notices) have been developed in consultation with the USFWS for mineral resource development and other surface-disturbing activities. The terms and conditions consist of specific measures to protect special status species and to comply with the Endangered Species Act (see Appendix C). These measures are required by law, are non-

discretionary, and are applicable under all alternatives. The impacts of these non-discretionary measures will not be analyzed in this document, as they are outside the scope of the planning process.

4.3.7.3.9.2 Alternative A

Because alternative-specific decisions regarding special status species are not specified under Alternative A, only the impacts common to all alternatives (see Section 4.3.7.3.8.1) would occur.

4.3.7.3.9.3 Alternative B

The following timing limitation stipulations would result in impacts to mineral resource development under Alternative B:

- a 242-day timing limitation stipulation in greater sage-grouse habitat (on 12,850 acres or 0.6% of all BLM lands), and
- a 57-day timing limitation stipulation in Gunnison sage-grouse habitat (on 246,107 acres or 13.4% of all BLM lands).

In both cases, the resulting impacts would be adverse compared to Alternative A and would take the form of extra cost and effort—for surveys, for the avoidance of occupied areas, for the re-routing of roads and pipelines and the re-siting of oil and gas facilities (i.e., permanent structures), or for directional drilling—or additionally operational time, if the surface-disturbance window does not accommodate an individual project's schedule and timeline and project activities need to be postponed.

Various, year-round restrictions on surface-disturbing activities and structures would apply as follows:

- within 2 miles of greater sage-grouse active strutting grounds (10,928 acres or 0.6% of all BLM lands);
- within 6 miles of Gunnison sage-grouse leks (246,107 acres or 13.4% of all BLM lands);
- within and near white-tailed prairie dog habitat (199,505 acres or 10.8% of all BLM lands); and
- within and near Gunnison prairie dog colonies (10,700 acres or 0.7% of all BLM lands).

Adverse impacts to mineral resource development would result from these decisions and would take the form of increased expenditures of time, cost, effort, and materials associated with re-siting projects or individual facilities or conducting directional drilling.

4.3.7.3.9.4 Alternative C

The following timing limitation stipulations would result in impacts to mineral resource development under Alternative C:

- a 242-day timing limitation stipulation in greater sage-grouse habitat (3,068 acres or 0.2% of all BLM lands), and
- a 57-day timing limitation stipulation in Gunnison sage-grouse habitat (175,727 acres or 9.6% of all BLM lands).

In both cases, the resulting impacts would be adverse to mineral resource development compared to Alternative A—though less so than Alternative B—and would take the form of extra cost, effort, or time, as described under Alternative B.

Various, year-round restrictions on surface-disturbing activities and structures would apply as follows:

- within 0.5 miles of greater sage-grouse active strutting grounds (3,068 acres or 0.2% of all BLM lands);
- within 0.6 miles of Gunnison sage-grouse leks (175,727 acres or 9.6% of all BLM lands);
- within and near white-tailed prairie dog habitat (117,481 acres or 6.4% of all BLM lands); and
- within and near Gunnison prairie dog colonies (10,700 acres or less than 0.6% of all BLM lands).

Adverse impacts to mineral resource development would result from these decisions—though less so than Alternative B due to lessened acreage affected—and would take the forms described under Alternative B.

4.3.7.3.9.5 Alternative D

The following timing limitation stipulations would result in impacts to mineral resource development under Alternative D:

- a 242-day timing limitation stipulation in greater sage-grouse habitat (1,986 acres or 0.1% of all BLM lands), and
- a 57-day timing limitation stipulation in Gunnison sage-grouse habitat (41,620 acres or 2.3% of all BLM lands).

In both cases, the resulting impacts would be adverse to mineral resource development compared to Alternative A—though less so than Alternatives B and C due to lessened acreage affected—and would take the form of extra cost, effort, or time, as described under Alternative B.

Year-round restrictions on surface-disturbing activities and structures would apply:

- within 0.25 miles of greater sage-grouse active strutting grounds (1,986 acres or 0.1% of all BLM lands);
- within 0.25 miles of Gunnison sage-grouse leks (41,620 acres or 2.3% of all BLM lands); and
- within and near white-tailed prairie dog habitat (41,620 acres or 1.7% of all BLM lands).

Adverse impacts to mineral resource development would result from these decisions—though less so than Alternatives B and C—and would take the forms described under Alternative B.

4.3.7.3.10 Impacts of Vegetation Management Decisions on Mineral Resource Development

Under all action alternatives, the vegetation management decision to implement the restrictions under Extreme (D3) and Exceptional (D4) drought conditions would result in adverse impacts to new mineral resource development. Under D3, no new surface-disturbing activities would be permitted in areas with fragile soils, and under D4, no new surface-disturbing activities would be permitted at all (subject to valid existing rights; see Appendix C and Appendix M). The impacts to mineral resource development would take the form of delayed completion of individual projects and the attendant increases in cost and effort.

4.3.7.3.11 Impacts of Visual Resource Management Decisions on Mineral Resource Development

4.3.7.3.11.1 Impacts Common to All Alternatives

Mineral resource development would be subject to the VRM class objectives of the area within which development would occur. VRM management on areas with lower scenic values (designated as VRM Class III and IV) imposes minimal restrictions on mineral resource development. Designation of an area as VRM Class I essentially closes the area to mineral resource activity. Management of areas as VRM Class II allows alteration of line, form, color and texture that characterize the existing landscape, although the resulting contrast should not attract the attention of the casual observer. Meeting VRM Class II objectives imposes additional costs on mineral resource developers. Table 4.47 quantifies the acreages of land within each VRM class.

Table 4.47. Acreages of Each VRM Class, by Alternative

VRM Class	Alternative A**	Alternative B	Alternative C	Alternative D
I	349,110	453,462	358,911	349,617
II	401,015	373,647	365,567	245,773
III	800,782	784,247	829,158	956,724
IV	271,356	210,533	268,133	269,641
Totals	**1,822,263**	**1,821,887**	**1,821,768**	**1,821,755**

* Note that these acreages include the 354,015 acres of WSAs and WAs, which are managed as VRM Class I and are non-discretionary closures. Table 4. 39 and other tables discussing the impacts of mineral resource development decisions on mineral resource development exclude these areas, and thus reflect different acreages.

**In Alternative A, VRM class reflects the VRM Inventory (except for 33,037 acres of VRM Class II and 67,236 acres of VRM Class III in management in Alternative A).

4.3.7.3.11.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, areas managed as VRM Classes II, III, and IV would typically be available to leasing with either standard lease terms or controlled surface use stipulations (see Table 4.47). This visual resource decision would generally have a beneficial effect on mineral resource development, in that more areas would be available under standard lease terms or controlled surface use stipulations, rather than being restricted with NSO. The beneficial impact would be that mineral exploration and development could still occur.

Under all action alternatives, direct, adverse impacts to mineral resource development resulting from VRM class I designations would include the exclusion of lands available for mineral resource development, a lower number of locations where potential wells could be drilled, a lower yield and commercial supply of oil and natural gas, and fewer royalties.

4.3.7.3.11.3 Alternative A

Under Alternative A, only WSAs would be designated as VRM Class I. Because the closure of WSAs to mineral resource development is non-discretionary, no impacts to mineral resources would result from visual resource management decisions under Alternative A.

4.3.7.3.11.4 Alternative B

Under Alternative B, approximately 453,462 acres (or 24.9% of BLM lands, including WSAs) would be designated as VRM Class I, which limits lands as either NSO or closed. In addition, 373,631 acres would be designated as VRM Class II, imposing additional costs on mineral resource developers. Adverse impacts resulting from these visual resource decisions under Alternative B would be of the same type as in Section 4.3.7.3.11.2. Alternative B proposes the greatest VRM-related limits to mineral resource development because the greatest number of acres would be designated as VRM Class I and Class II.

4.3.7.3.11.5 Alternative C

Under Alternative C, approximately 359,020 acres (or 19.7% of BLM lands, including WSAs) would be designated as VRM Class I class, which limits lands as either NSO or closed. In addition, 365,567 acres would be designated as VRM Class II, imposing additional costs on mineral resource developers. Adverse impacts resulting from these visual resource decisions under Alternative C would be of the same type as in Section 4.3.7.3.11.2, though less so than under Alternative B and more than under Alternative D.

4.3.7.3.11.6 Alternative D

Under Alternative D, approximately 349,617 acres (or 19.2% of BLM lands, including WSAs) would fall into the VRM I class, which consistently limits lands as either NSO or closed. In addition, 245,773 acres would be managed as VRM II, imposing additional costs on mineral resource developers. Adverse impacts resulting from these visual resource decisions under

Alternative D would be of the same type as in Section 4.3.7.3.11.2, though less so than under Alternatives B and C.

4.3.7.3.12 Impacts of Wildlife and Fisheries Decisions on Mineral Resource Development

4.3.7.3.12.1 Impacts Common to All Alternatives

All alternatives include some degree of spatial or temporal limitation on surface-disturbing activities to protect wildlife populations and their important habitats. In the case of mineral resource development, specific conditions of approval, lease terms, and/or discretionary measures are often required in order to mitigate the adverse impacts of development activities on wildlife.

The discretionary measures include spatial and temporal limitations (hereafter referred to as controlled surface use and timing limitation stipulations, respectively), which would have an adverse impact on mineral resource development by increasing exploration costs, time, and effort. However, the degree and magnitude of such increases depend on many factors, including the options for project siting, the locale of the lease, and the drilling schedule and window.

The MFO coordinates with UDWR for the purpose of protecting wildlife species (see Appendixes K, N, and O). Under all alternatives, mineral resource developers would be required to avoid surface-disturbing activities in occupied, migratory bird habitat during nesting season. Under all alternatives, these timing limitation stipulations and the associated limited drilling window only apply to up to one mile around migratory bird and raptor nests. Therefore, impacts would be adverse for operators with leases within these buffer areas, but not elsewhere. These stipulations could be waived or modified, depending on the species (see Appendix C for details). In addition, spatial buffers and timing limitation stipulations would be applied to areas around occupied raptor nest sites during their nesting seasons. This would result in planning area-wide impacts upon mineral resource development (see Appendixes N and O). Adverse impacts upon mineral resource development, in terms of extra costs, time, and effort, would result.

The *exact* impact of wildlife management decisions common to all cannot be quantified. Exact acreages of habitat to be restricted would depend on the results of field surveys associated with specific projects within the MPA. However, some general conclusions can be drawn regarding the timing limitation stipulations. The fall and winter months (i.e., September through February) generally would have the fewest timing limitation stipulations upon mineral resource development, while the spring and summer months (i.e., March through August) generally would have the most. The most restrictive months of the year would be April through July; most timing limitation stipulations would be in effect during that period. Together, these decisions would result in adverse impacts to mineral resource development at the planning area-wide level.

4.3.7.3.12.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, a 92-day timing limitation stipulation on surface-disturbing activities in the Hatch Point bighorn sheep habitat (9,278 acres, or 0.5% of all BLM lands) and a 46-day timing limitation stipulation on surface-disturbing activities in deer and elk summer range (105,636 acres, or 5.8% of all BLM lands) would result in adverse impacts, in the form of delayed or slowed implementation of individual projects if the surface-disturbance limitation did not suit that project's schedule and timeline.

Under all action alternatives, the timing limitation stipulations (see Section 4.3.7.3.2.1) and the associated limited drilling window only apply to 9,278 acres of bighorn lambing and rutting areas within Hatch Point. This constitutes less than 1% of the MPA. Impacts would be adverse for operators with leases within the habitat or buffer areas, but not elsewhere. These stipulations could be waived or modified, depending on the species (see Appendix C for details).

4.3.7.3.12.3 Alternative A

Three wildlife management decisions would result in impacts to mineral resource development under Alternative A:

- a Category 2 stipulation in 25,431 acres of desert bighorn sheep habitat, year-round;
- a prohibition on surface disturbance in 42,500 acres of desert bighorn sheep lambing and breeding habitat; and
- a prohibition on surface disturbance in 260,769 acres of deer and elk winter range.

These decisions together would result in development limitations on a maximum of 328,700 possible acres (or 18.1% of BLM lands) for 90 days of the year. This would be an adverse impact to mineral resource development and would take the form of delayed or slowed implementation of individual projects in these habitats if the surface-disturbance limitation did not suit that project's schedule and timeline.

4.3.7.3.12.4 Alternative B

The following wildlife management decisions would result in impacts to mineral resource development under Alternative B:

- a 46-day timing limitation stipulation in pronghorn habitat (822,001 acres or 45.1% of all BLM lands);
- a 92-day timing limitation stipulation in Rocky Mountain bighorn sheep habitat (458,242 acres or 23.6% of all BLM lands);
- a 196-day timing limitation stipulation on deer and elk winter range (635,774 acres or 34.8% of all BLM lands); and
- a year-round, NSO stipulation in desert bighorn sheep habitat (130,419 acres or 7.1% of all BLM lands).

In all cases, the resulting impacts would be adverse compared to Alternative A and would take the form of extra cost and effort—for surveys, for the avoidance of occupied areas, for the re-routing of roads and pipelines and the re-siting of oil and gas facilities (i.e., permanent structures), or for directional drilling—or extra operational time, if the surface-disturbance window does not accommodate an individual project's schedule and timeline and project activities need to be postponed.

4.3.7.3.12.5 Alternative C

The following species management decisions would result in impacts to mineral resource development under Alternative C:

- a 46-day timing limitation stipulation in pronghorn habitat (293,741 acres or 16.1% of all BLM lands);
- a 92-day timing limitation stipulation in Rocky Mountain bighorn sheep habitat (310,726 acres or 17.1% of all BLM lands);
- a 151-day timing limitation stipulation on deer and elk winter range (349,955 acres or 15.2% of all BLM lands); and
- a year-round, NSO stipulation in desert bighorn sheep habitat (101,897 acres or 5.6% of all BLM lands).

In all cases, the resulting impacts would be adverse to mineral resource development compared to Alternative A—though less so than Alternative B because of lesser time periods or reduced acreage—and would take the form of extra cost, effort, or time, as described under Alternative B.

4.3.7.3.12.6 Alternative D

The following wildlife management decisions would result in impacts to mineral resource development under Alternative D:

- a 46-day timing limitation stipulation in pronghorn habitat (78,477 acres or 4.3% of all BLM lands);
- the "recognition" of 194,560 acres, or 10.7% of all BLM lands as Rocky Mountain bighorn sheep habitat (BLM 1985a, 1986, 1993b);
- a 136-day timing limitation stipulation on deer and elk winter range (349,955 acres or 15.2% of all BLM lands); and
- a 137-day timing limitation stipulation in desert bighorn sheep habitat (46,319 acres or 2.5% of all BLM lands).

The resulting impacts would be adverse to mineral resource development compared to Alternative A—though less so than Alternatives B and C because of lesser time periods or reduced acreage—and would take the form of extra cost, effort, or time, as described under Alternative B.

4.3.7.4 SUMMARY OF IMPACTS

The alternatives propose varying amounts and types of restrictions on the exploration, development, and production of mineral resources. Generally, Alternative B is the most restrictive, while Alternative A is the least restrictive. Among the action alternatives, Alternative B is the least amenable, and Alternative D is the most amenable to the exploration, development and production of mineral resources.

Impacts from lands and realty, paleontological resources, riparian areas, and vegetation management actions would result only in Impacts Common to All Alternatives (including Alternative A) or Impacts Common to All Action Alternatives (excluding Alternative A). Withdrawal decisions would adversely impact 4.3% of all BLM land, other impacts resulting from lands and realty, paleontological, riparian, and vegetation decisions, while not quantifiable, generally would result in additional restrictions to mineral development.

4.3.8 NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS

This section analyzes impacts to the 266,435 acres of non-WSA lands determined to have wilderness characteristics from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning non-WSA lands with wilderness characteristics are described in Chapter 3, Affected Environment.

Non-WSA lands with wilderness characteristics are areas of 5,000 acres or more, with landscapes generally in a natural or undisturbed condition. These areas also provide outstanding opportunities for solitude or primitive forms of recreation (non-motorized and non-mechanized activities in undeveloped settings). All of the alternatives would impact the values of non-WSA areas with wilderness characteristics to some degree. Generally, actions that create surface disturbance impact the natural character of these areas, and the setting for experiences of solitude and primitive recreational activities. Motorized uses in these areas detract from opportunities for both solitude and primitive forms of recreation.

Resources or uses determined not to have any impacts on non-WSA lands with wilderness characteristics include the following: Air Quality, and Health and Safety. There are no abandoned mine lands, unauthorized dumping sites, or hazardous materials spills that have been identified in non-WSA lands with wilderness characteristics; therefore, it is not an issue or resource for further analysis.

4.3.8.1 IMPACTS COMMON TO ALL ALTERNATIVES

There would be no impacts common to all alternatives for non-WSA lands managed to protect wilderness characteristics because no lands would be managed to maintain wilderness characteristics outside designated wilderness and WSAs in either Alternatives A or D.

4.3.8.2 ALTERNATIVES IMPACTS

Impacts to non-WSA lands with wilderness characteristics are analyzed based on the enhancement (beneficial impacts) or degradation (adverse impacts) of naturalness and outstanding opportunities for solitude or primitive recreation.

4.3.8.2.1 IMPACTS OF CULTURAL RESOURCES DECISIONS ON NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS

4.3.8.2.1.1 Alternative A

Alternative A would not limit visitation or camping in high-density cultural sites when archeological site integrity may be endangered. However, areas where these high-density sites are primarily located (Behind-the-Rocks, Mill Creek Canyon, and Negro Bill Canyon non-WSA lands with wilderness characteristics) are already in areas where OHV use is limited to designated routes and camping is restricted.

4.3.8.2.1.2 Alternatives B, C and D

The cultural resource decisions under common to all action alternatives provide protection of cultural resources, including avoiding or minimizing impacts within Traditional Cultural Properties, closing areas to visitor use when it is endangering site integrity, prohibiting camping within or on archeological and historic sites, protecting and mitigating sensitive cultural sites being impacted by grazing activities, monitoring sites, inventorying new sites, ensuring compliance with the National Historic Preservation Act, implementing interim protection to newly discovered sites, mitigating impacts to sites, allocating sites to public and scientific purposes, consulting with Tribes, and others. Protection of historic and prehistoric resources in non-WSA lands with wilderness characteristics would enhance opportunities for primitive forms of recreation. Knowing more about the cultural resources of an area, interpreting the resource in an appropriate fashion, and viewing cultural resource sites in the non-WSA areas with wilderness characteristics all add to the enjoyment of these areas for primitive recreational purposes. And, protection of cultural resources adds to the character of the setting that supports these recreational opportunities.

There are no additional cultural resource decisions that would impact non-WSA lands with wilderness characteristics under these alternatives.

4.3.8.2.2 IMPACTS OF FIRE MANAGEMENT DECISIONS ON NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS

Under all alternatives, BLM would attempt to restore natural fire regimes in fire-dependent and adapted ecosystems through the use of prescribed or managed wildland fire. The MFO would base its priorities for all aspects of fire management decisions based on five categories (see Chapter 2, Table 2.1 Fire Management) to determine where fire is desired and where it is not. Further, following any wildland fire event, emergency stabilization and restoration (ESR) actions would be developed and implemented, as appropriate. Fuels treatment and management activities

would be consistent with the resource goals and objectives in the RMP and may include mechanical treatments, manual treatments, prescribed fire, chemical spraying, or biological treatments and seeding.

Restoration of the use of fire to fire-dependent and adapted ecosystems would restore a more natural vegetation community (in both species and composition) and watershed conditions and wildlife populations dependent on those communities. In the short-term, a burned landscape may reduce opportunities for primitive recreation. In the long-term, however, a more natural landscape would benefit the natural character of non-WSA lands with wilderness characteristics and enhance the setting and opportunities for primitive forms of recreation, including hiking, backpacking, hunting, wildlife viewing, and nature study. This would enhance the natural conditions of these areas.

Setting fire objectives through fire management categories would identify where fire is desired on the land, leading to the same benefits to natural conditions as restoring the use of fire to fire-dependent and adapted ecosystems. When it is necessary to suppress fire in non-WSA lands with wilderness characteristics, development and implementation of the ESR plan will restore fire suppression disturbances to the land and vegetation (e.g., fire line construction), resulting in the restoration of the natural character of the non-WSA areas. Fuels treatments in non-WSA lands with wilderness characteristics would aid in restoration of a more natural fire regime in these lands. The use of fire to accomplish this reduction would be compatible with the natural character of these areas. The use of mechanical treatments would leave an apparent imprint of human work on the land that would degrade the natural character of the non-WSA lands with wilderness characteristics.

In the short-term, fire operations (aircraft over-flights, fire line construction, etc.) would degrade the natural landscape and character of the non-WSA lands with wilderness characteristics. The noise and presence of the people, equipment, and operations would also diminish opportunities for solitude and primitive forms of recreation. In the long-term, however, surface disturbance associated with the fire treatment would be restored, with little to no net effect on naturalness. The effects of fire operations on opportunities for solitude and primitive recreation would cease, restoring those opportunities.

4.3.8.2.3 Impact of Lands and Realty Management Decisions on Non-WSA Lands with Wilderness Characteristics

4.3.8.2.3.1 Common to All Alternatives

Under all alternatives, the Three Rivers withdrawal would remain in place. This would protect portions along the river of the Beaver Creek, Dome Plateau, Fisher Towers, Mary Jane Canyon, Gooseneck and Labyrinth Canyon non-WSA lands with wilderness characteristics. The mineral withdrawal would continue to preserve the naturalness and opportunities for both solitude and primitive forms of recreation in each of these areas by preventing mining claims and the noise and presence of surface disturbance, people, vehicles, and equipment associated with mining.

4.3.8.2.3.2 Alternative A

This alternative proposes land disposal for about 1,300 acres of public lands on the east side portion of the Behind the Rocks non-WSA lands with wilderness characteristics. Disposal of these lands would take them out of public ownership and allow for development and surface disturbing activities out of BLM's control. The wilderness characteristics would be foregone.

All of Shafer Canyon and Gooseneck, and a portion of Goldbar (2,437 acres) and Labyrinth Canyon (12,000) non-WSA lands with wilderness characteristics would continue to be rights-of-way avoidance areas (Table 4.48). These areas are to be avoided but may be available for location of right-of-ways with special stipulations if the proposal meets the goals and objectives of other resources and uses in the land use plan. It is expected and assumed that the avoidance areas would protect the natural character of the non-WSA lands in these areas. However, the rest of the non-WSA lands with wilderness characteristics (249,363 acres) would remain available for the placement of rights-of-way. More permanent, long term impacts would occur if the right-of-way is for an overhead powerline than for a buried pipeline. However, any surface disturbing activity and/or placement of permanent visual facilities would detract from the natural character of the area and disrupt the setting needed to support primitive forms of recreation.

Table 4.48. Acres of Avoidance or Exclusion for Rights-of-way (ROWs) in Non-WSA Lands with Wilderness Characteristics

Name of Non-WSA Land with Wilderness Characteristics	Total Acres	Alternative A	Alternative B (all acres are exclusion)	Alternative. C (all acres are avoidance)	Alternative D
Arches Adjacent	6,396	0	6,396	513	513
Beaver Creek	25,722	0	25,722	25,722*	8,152
Behind the Rocks	3,643	0	3,643	1,582	55
Big Triangle	5,200	0	5,200	0	0
Coal Canyon	21,632	0	21,632	0	0
Dead Horse Cliffs	797	0	797	98	0
Desolation Canyon	10,498	0	10,498	985	244
Dome Plateau	14,207	0	14,207	9,580	6,390
Fisher Towers	17,235	0	17,235	8,153	3,312
Floy Canyon	9,983	0	9,983	0	0
Flume Canyon	3,520	0	3,520	730	0
Goldbar	6,437	2,437	6,437	6,064	543
Gooseneck	843	843	843	843	0
Granite Creek	4,528	0	4,528	0	0
Harts Point	1,465	0	1,465	0	0
Hatch/Harts/Lockhart	2,670	0	2,670	0	0
Hatch Wash	10,983	0	10,983	0	0
Hells Hole	2,538	0	2,538	0	0

Table 4.48. Acres of Avoidance or Exclusion for Rights-of-way (ROWs) in Non-WSA Lands with Wilderness Characteristics

Name of Non-WSA Land with Wilderness Characteristics	Total Acres	Alternative A	Alternative B (all acres are exclusion)	Alternative. C (all acres are avoidance)	Alternative D
Hideout Canyon	11,607	0	11,607	0	0
Horsethief Point	8,358	0	8,358	1,190	1,162
Hunter Canyon	4,465	0	4,465	2,855	310
Labyrinth Canyon	25,361	12,000	25,361	17,954	2,456
Lost Spring Canyon	11,456	0	11,456	0	0
Mary Jane Canyon	24,779	0	24,779	22,169	976
Mill Creek Canyon	3,388	0	3,388	3,388	59
Mexico Point	12,837	0	12,837	0	0
Negro Bill Canyon	2,333	0	2,333	1,177	240
Shafer Canyon	1,842	1,842	1,842	1,842	0
Spruce Canyon	1,131	0	1,131	957	0
Westwater Canyon	3,086	0	3,086	84	0
Westwater Creek	7,188	0	7,188	0	40
Yellow Bird	357	0	357	0	0
Total Acres	**266,485**	**17,122**	**266,485**	**105,886**	**24,455**
Total Acres Open for Rights of Way		249,363	0	160,599	242,030

Note: All acreage not under exclusion or avoidance remains open for ROW.

* 6,358 acres are exclusion.

4.3.8.2.3.3 Alternative B

Under this alternative, all non-WSA lands with wilderness characteristics would be managed as right-of-way exclusion areas. Exclusion from future rights-of-way development for pipelines and powerlines, corridor designation, or other rights-of-ways would protect the natural character in all these lands. Protection of the natural landscape would also preserve the setting needed to support primitive forms of recreation and experiences of solitude. The same protections would prevent corridor designations within any of the non-WSA lands with wilderness characteristics, thus protecting those values.

4.3.8.2.3.4 Alternative C

Both the Behind the Rocks and Floy Canyon non-WSA lands with wilderness characteristics would have small portions of them overlain by designated utility corridors. The Behind the Rocks non-WSA area (east side) would be partially overlain by the proposed Spanish Valley corridor. The southern-most part of Floy Canyon would be partially within the 1/2 mile width of

the I-70 proposed utility corridor. Placement of future utility rights-of-ways within these portions of the corridors would diminish the wilderness characteristics by creating surface disturbing activities (and possibly placing surface facilities) that would no longer maintain the wilderness characteristics values in the most southern portion of the Floy Canyon area.

Non-WSA lands with wilderness characteristics that would remain open to rights-of-way permitting include all of 13 areas and portions of 15 areas, totaling 160,599 acres (see Table 4.48). Presently there are no proposals for rights-of-ways in these areas; however, if that opportunity arises, more permanent, long term impacts would occur if the right-of-way is for an overhead powerline than for a buried pipeline. Any surface disturbing activity and/or placement of permanent visual facilities would detract from the natural character of the area and disrupt the setting needed to support primitive forms of recreation.

There are 105,886 acres in 19 non-WSA lands with wilderness characteristics areas that would be protected, in whole or in part, from surface disturbing actives under this alternative because they would be rights-of-way avoidance areas (see Table 4.48). Beaver Creek, Gooseneck, Mill Creek Canyon and Shafer Canyon would be completely within the avoidance areas. These areas are to be avoided but may be available for location of right-of-ways with special stipulations if the proposal meets the goals and objectives of other resources and uses in the land use plan. It is expected and assumed that the avoidance areas would protect the natural character of the non-WSA lands in these areas.

4.3.8.2.3.5 Alternative D

Both the Behind the Rocks and Floy Canyon non-WSA lands with wilderness characteristics would have minor portions of them overlain by designated utility corridors. The Behind the Rocks non-WSA area (east side) would be partially overlain by the proposed Spanish Valley corridor (same as Alternative C). Floy Canyon would be partially within the 1 mile width of the I-70 proposed utility corridor. Placement of future utility rights-of-way within these portions of the corridors would diminish the wilderness characteristics of these areas by causing surface disturbing activities (and possible placing surface facilities) that would no longer maintain the wilderness characteristics values. Floy Canyon would have more potential impacts than in Alternative C because the corridor width would be 1 mile on each side of I-70, providing more room for the placement of additional rights-of-way.

Non-WSA lands with wilderness characteristics that would remain open to rights-of-way permitting include all of 18 areas and portions of 14 areas, totaling 242,030 acres. Presently there are no proposals for rights-of-ways in these areas, however, if that opportunity arises, more permanent, long term impacts would occur if the right-of-way is for an overhead powerline than for a buried pipeline. Any surface disturbing activity and/or placement of permanent visual facilities would detract from the natural character of the area and disrupt the setting needed to support primitive forms of recreation.

There are 14 non-WSA lands with wilderness characteristics areas, totaling 24,455 acres that would be protected, in part, from surface disturbing actives under this alternative because they would be rights-of-way avoidance areas (see Table 4.48). None of the areas would be completely

within an avoidance area. These areas are to be avoided but may be available for location of right-of-ways with special stipulations if the proposal meets the goals and objectives of other resources and uses in the land use plan. It is expected and assumed that the avoidance areas would protect the natural character of the non-WSA lands in these areas. Because none of the avoidance areas protect 5,000 acres of the stand alone areas, those areas could be subject to losing their wilderness characteristics if rights-of-way were developed on the non-WSA lands outside of the avoidance areas.

4.3.8.2.4 Impacts of Livestock Grazing on Non-WSA Lands with Wilderness Characteristics

Livestock grazing is guided by livestock objectives set in the Standards for Rangeland Health and Guidelines for Grazing Management. Proper levels of livestock use are guided by these objectives, thus, it is not anticipated that livestock grazing would have impacts on non-WSA lands with wilderness characteristics under any alternatives because meeting these objectives would not permit degradation of the lands. When livestock use is properly managed, it would not affect the appearance of naturalness. Grazing assessments completed by MFO staff and any subsequent actions taken to remedy impending issues would enhance the natural character of non-WSA lands with wilderness characteristics. Further, improved natural condition would sustain the setting needed to support opportunities for primitive and unconfined recreation and the experience of solitude that visitors seek.

While there could be some visual evidence of livestock use in the areas (presence of livestock, feces, trampling of soil, fences, and consumption of vegetation), rangeland health and riparian conditions would be maintained through proper management under the Standards and Guides assessments, and the appearance of a natural condition of these areas would be maintained. For some visitors, the presence of livestock would be an adverse impact on the desired experience (connection with the natural world and experiences of solitude). However, this effect would be seasonal. At other times of the year, livestock would not be present, soils would recover, and vegetation would re-grow, reducing the impact on the visitor.

Under all alternatives, the Negro Bill Canyon non-WSA lands with wilderness characteristics area would remain unavailable for livestock grazing. In addition, small portions of some of the non-WSA lands with wilderness characteristics would be unavailable for grazing under the range of alternatives. When some visitors encounter an area with little or no evidence of livestock use, their experience of solitude and primitive recreation may be enhanced.

4.3.8.2.5 Impacts of Mineral Resources on Non-WSA Lands with Wilderness Characteristics

4.3.8.2.5.1 Oil and Gas

The mineral assumptions for analysis and the Reasonably Foreseeable Development scenarios presented in the beginning of this chapter were used in the analysis of impacts to non-WSA lands with wilderness characteristics. These RFD scenarios for oil and gas development were derived

from the Mineral Potential Report for the MPA (BLM 2005e). Of the seven RFD areas identified in the MPA, non-WSA lands with wilderness characteristics fall within three of them.

The Bookcliffs RFD Area totals 151,834 acres outside of WSAs. It encompasses seven non-WSA lands with wilderness characteristics areas which total 60,453 acres, or about 39% of the RFD area (see Table 4.49). About 28,277 acres within non-WSA lands with wilderness characteristics are currently leased.

Table 4.49. Bookcliffs RFD Area and Non-WSA Lands with Wilderness Characteristics

Name of Non-WSA Lands with Wilderness Characteristics	Percent of Bookcliffs RFD Area	Acres of Unit with Existing Leases and % of Total
Coal Canyon	14%	13,312 (62%)
Flume Canyon	2%	1,355 (38%)
Hells Hole	2%	1,724 (68%)
Hideout Canyon	7%	5,399 (46%)
Mexico Point	8%	6,294 (49%)
Spruce Canyon	1%	161 (14%)
Westwater Creek	5%	32 (<1%)

The Big Flat-Hatch Point RFD Area has a total of 391,149 acres outside of WSAs. It includes 11 non-WSA lands with wilderness characteristics areas which total 66,864 acres, or about 17% of the area (see Table 4.50). About 10,127 acres within non-WSA lands with wilderness characteristics are currently leased.

Table 4.50. Big Flat-Hatch Point RFD Area and Non-WSA Lands with Wilderness Characteristics

Name of Non-WSA Lands with Wilderness Characteristics	Percent of Big Flat-Hatch Point RFD Area	Acres of Unit with Existing Leases and % of Total
Behind the Rocks	<1%	0
Dead Horse Cliffs	<1%	237 (30%)
Goldbar	2%	1,125 (17%)
Gooseneck	<1%	0
Harts Point	<1%	0
Hatch Wash	3%	3,006 (27%)
Hatch/Lockhart/Hart	<1%	833 (31%)
Horsethief Point	2%	838 (10%)
Hunter Canyon	1%	251 (5%)
Labyrinth Canyon	6%	3,658 (14%)
Shafer Canyon	<1%	179 (9%)

The Eastern Paradox RFD Area has a total of 556,389 acres outside of WSAs. It encompasses fourteen non-WSA lands with wilderness characteristics areas which total 138,410 acres, or about 25% of the area (see Table 4.51). About 12,117 acres of non-WSA lands with wilderness characteristics are currently leased.

Table 4.51. Eastern Paradox RFD Area and Non-WSA Lands with Wilderness Characteristics

Name of Non-WSA Lands with Wilderness Characteristics	Percent of Eastern Paradox RFD Area	Acres of Unit with Existing Leases and % of Total
Arches Adjacent	1%	56 (<1%)
Beaver Creek	5%	0
Big Triangle	<1%	0
Desolation Canyon	2%	0
Dome Plateau	3%	2,364 (17%)
Fisher Towers	3%	0
Floy Canyon	2%	8,859 (86%)
Granite Creek	1%	0
Lost Spring Canyon	2%	771 (6%)
Mary Jane Canyon	4%	0
Mill Creek Canyon	<1%	0
Negro Bill Canyon	<1%	0
Westwater Canyon	<1%	0
Yellow Bird	<1%	67 (18%)

Each of the three RFD areas has differing projections for oil and gas development by alternative. Table 4.52 portrays those projections. It is assumed that 15 acres would be disturbed for every well drilled.

Table 4.52. RFD Areas with Projected Number of Wells per Year, over 15 Years

RFD Areas (Acres outside WSAs)	Projected Wells Per Year/over 15 Years			
	Alternative A	Alternative B	Alternative C	Alternative D
Bookcliffs (151,834)	~7 / 104	~4 / 64	~7 / 104	~7 / 104
Big Flat – Hatch Point (391,149)	~3 / 46	~1 / 19	~2 / 34	~3 / 44
Eastern Paradox (556,389)	~2 / 34	~1 / 21	~2 / 28	~2 / 32

Impacts Associated with Oil and Gas Leasing/Development under All Alternatives

A number of variables would determine the degree of impact to non-WSA lands with wilderness characteristics, including where surface-disturbing activities occur, land form or topography, vegetation type, sequence of development, and reclamation time. Soil types and climate would affect the time it takes to reclaim disturbances. Successful reclamation would take about 10 years.

Construction and operation of oil and gas wells and associated support facilities, including roads, surface and buried pipelines, power lines, and compressor stations would create soil and vegetation disturbance and the presence of permanent structures that would degrade the natural characteristics of non-WSA lands with wilderness characteristics. In addition to site-specific surface disturbance, the cumulative number of wells would change the appearance of naturalness.

The noise of construction and operation of producing wells, including the presence of work crews, vehicles, and equipment, would degrade opportunities for solitude and conflict with primitive recreational opportunities in proximity to industrial development. As recreational visitors move away from the sources of development, the sights and sounds of development would diminish. However, it can be expected that sights and sounds from development would reduce opportunities for solitude and primitive and unconfined recreation up to one-half mile beyond the direct loss of natural character.

Table 4.53 displays the oil and gas leasing stipulations, by alternative, for each of the non-WSA lands with wilderness characteristics.

Table 4.53. Non-WSA Lands with Wilderness Characteristics Leasing Stipulations By Alternative

Name	Total Acres	Currently Leased	Stipulation	Alt. A	Alt. B	Alt. C	Alt. D
Arches Adjacent	6396	56	Standard	6396	0	0	0
			CSU/TL	0	0	5883	5883
			NSO	0	0	513	513
			Closed	0	6396	0	0
Beaver Creek	25722	0	Standard	17744	0	0	3956
			CSU/TL	3030	0	0	13614
			NSO	4948	0	19364	8152
			Closed		25722	6358	0
Behind the Rocks	3643	0	Standard	2616	0	1339	3588
			CSU/TL	0	0	684	0
			NSO	1019	0	1582	55
			Closed		3643	0	0
Big Triangle	5200	0	Standard	137	0	659	659
			CSU/TL	5063	0	4541	4541
			NSO	0	0	0	0
			Closed	0	5200	0	0
Coal Canyon	21632	13312	Standard	15145	0	6831	13069
			CSU/TL	5129	0	14801	8563
			NSO	0	0	0	0
			Closed	0	21632	0	0

Table 4.53. Non-WSA Lands with Wilderness Characteristics Leasing Stipulations By Alternative

Name	Total Acres	Currently Leased	Stipulation	Alt. A	Alt. B	Alt. C	Alt. D
Dead Horse Cliffs	797	237	Standard	512	0	0	642
			CSU/TL	0	0	699	121
			NSO	250	0	98	34
			Closed	35	797	0	0
Desolation Canyon	10498	0	Standard	1378	0	411	1286
			CSU/TL	9120	0	9102	8968
			NSO	0	0	985	250
			Closed	0	10498	0	0
Dome Plateau	14207	2364	Standard	12255	0	2252	2373
			CSU/TL	1952	0	2375	5444
			NSO	0	0	8267	6390
			Closed	0	14207	1313	0
Fisher Towers	17235	0	Standard	14810	0	4238	4763
			CSU/TL	1328	0	4551	9173
			NSO	1097	0	4528	3312
			Closed	0	17235	3625	0
Floy Canyon	9983	8589	Standard	3615	0	3422	5064
			CSU/TL	6368	0	6561	4919
			NSO	0	0	0	0
			Closed	0	9983	0	0
Flume Canyon	3520	1355	Standard	1709	0	1952	1263
			CSU/TL	1682	0	838	2257
			NSO	129	0	730	0
			Closed	0	3520	0	0
Goldbar	6437	1125	Standard	4565	0	0	5802
			CSU/TL	1735	0	373	419
			NSO	0	0	6064	543
			Closed	0	6437	0	0
Gooseneck	843	0	Standard	275	0	0	530
			CSU/TL	530	0	0	313
			NSO	0	0	843	0
			Closed	0	843	0	0
Granite Creek	4528	0	Standard	431	0	1378	13
			CSU/TL	4097	0	3150	4515
			NSO	0	0	0	0
			Closed	0	4528	0	0

Table 4.53. Non-WSA Lands with Wilderness Characteristics Leasing Stipulations By Alternative

Name	Total Acres	Currently Leased	Stipulation	Alt. A	Alt. B	Alt. C	Alt. D
Harts Point (MFO)	1465	0	Standard	0	0	0	33
			CSU/TL	1436	0	1429	1432
			NSO	29	0	36	0
			Closed	0	1465	0	0
Hatch Wash	10983	3006	Standard	0	0	3366	5842
			CSU/TL	10983	0	7617	5141
			NSO	0	0	0	0
			Closed	0	10983	0	0
Hatch/Lockhart/Hart	2670	833	Standard	0	0	0	114
			CSU/TL	2670	0	2670	2556
			NSO	0	0	0	0
			Closed	0	2670	0	0
Hells Hole	2538	1,724	Standard	0	0	0	180
			CSU/TL	2538	0	2538	2358
			NSO	0	0	0	0
			Closed	0	2538	0	0
Hideout Canyon	11607	5399	Standard	0	0	0	0
			CSU/TL	11607	0	11607	11607
			NSO	0	0	0	0
			Closed	0	11607	0	0
Horsethief Point	8358	838	Standard	7417	0	2326	6824
			CSU/TL		0	4842	372
			NSO	816	0	1190	1162
			Closed	125	8358	0	0
Hunter Canyon	4465	251	Standard	3092	0	0	4155
			CSU/TL	0	0	1610	0
			NSO	1373	0	2855	310
			Closed	0	4465	0	0
Labyrinth Canyon	25361	3658	Standard	20545	0	6774	15534
			CSU/TL	2105	0	271	7053
			NSO	2458	0	17954	2456
			Closed	0	25361	0	0
Lost Spring Canyon	11456	771	Standard	11456	0	5588	4363
			CSU/TL	0	0	5823	7093
			NSO	0	0	45	0
			Closed	0	11456	0	0

Table 4.53. Non-WSA Lands with Wilderness Characteristics Leasing Stipulations By Alternative

Name	Total Acres	Currently Leased	Stipulation	Alt. A	Alt. B	Alt. C	Alt. D
Mary Jane Canyon	24779	0	Standard	21076	0	122	1995
			CSU/TL	3703	0	2457	21807
			NSO	0	0	8993	946
			Closed	0	24779	13176	0
Mexico Point	12837	6294	Standard	0	0	0	0
			CSU/TL	12837	0	12837	12837
			NSO	0	0	0	0
			Closed	0	12837	0	0
Mill Creek Canyon	3388	0	Standard	3051	0	0	192
			CSU/TL		0	0	3127
			NSO	337	0	3388	69
			Closed	0	3388	0	0
Negro Bill Canyon	2333	0	Standard	2226	0	0	0
			CSU/TL	0	0	1156	2093
			NSO	107	0	1177	240
			Closed	0	2333	0	0
Shafer Canyon	1842	179	Standard	900	0	0	129
			CSU/TL	0	0	0	1700
			NSO	942	0	1842	13
			Closed	0	1842	0	0
Spruce Canyon	1131	161	Standard	0	0	13	13
			CSU/TL	1131	0	161	1118
			NSO	0	0	957	0
			Closed	0	1131	0	0
Westwater Canyon	3086	0	Standard	2251	0	1835	1876
			CSU/TL	0	0	1171	1170
			NSO	840	0	84	40
			Closed	0	2328	0	0
Westwater Creek	7188	32	Standard	0	0	0	0
			CSU/TL	7188	0	7188	7188
			NSO	0	0	0	0
			Closed	0	7188	0	0
Yellow Bird	357	67	Standard	357	0	233	
			CSU/TL	0	0	124	357
			NSO	0	0	0	0
			Closed	0	357	0	0

Alternative A

All or parts of the 32 non-WSA lands with wilderness characteristics areas would remain open to leasing and development under standard oil and gas stipulations or under controlled surface use or timing limitation stipulations (250,853 acres). This comprises about 94% of these areas. Six percent of the non-WSA lands with wilderness characteristics (within 12 areas) would be either closed to leasing or have a no surface occupancy stipulation on the leases.

In the Book Cliffs RFD area, all seven non-WSA wilderness characteristics areas would remain open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (60,324). Only 129 acres in Flume Canyon (4%) would have a no surface occupancy stipulation applied to the lease. Based on the percentage of non-WSA lands with wilderness characteristics and the existing leases within those areas, the highest potential for leasing and/or development would be in Coal Canyon, Hideout Canyon, Mexico Point, or Hells Hole. Given that the projection for drilling for oil and gas is 7 wells/year for the whole RFD area, and that 39% of the RFD area encompasses non-WSA lands with wilderness characteristics, up to three wells per year—or up to 45 wells over a 15 year period—could be drilled within these areas. This could disturb up to 45 acres per year, or up to 675 acres over the life of the plan. Leasing and development within these non-WSA areas would cause that portion to lose their natural character and opportunities for solitude and primitive recreation due to exploration for and development of oil and gas resources. However, it is not anticipated that any of the areas would lose their wilderness characteristics in totality because of the small amount of acreage projected to be disturbed and the number of projected wells in this RFD area over the 15 year scenario.

In the Big Flat-Hatch Point RFD area, all eleven non-WSA wilderness characteristics areas would remain partially open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations. However, 1,019 acres (28%) in Behind the Rocks, 285 acres (36%) in Dead Horse Cliffs, 941 acres (11%) in Horsethief Point, 1,373 acres (31%) in Hunter Canyon, 2,458 acres (10%) in Labyrinth Canyon and 945 acres (51%) in Shafer Canyon would be under a no-surface occupancy stipulation or closed to leasing. Based on the percentage of non-WSA lands with wilderness characteristics and the existing leases within those areas, the highest potential for leasing and/or development would be in Labyrinth Canyon, Hatch Wash, or Goldbar. Given that the projection for drilling for oil and gas is 3 wells/year for the whole RFD area, and that 17% of the RFD area encompasses non-WSA lands with wilderness characteristics, up to one well per year—or up to 15 wells over a 15 year period—could be drilled within the non-WSA areas. This could disturb up to 15 acres per year, or up to 225 acres over the life of the plan. Leasing and development within these non-WSA areas could cause that portion to lose its natural character and opportunities for solitude and primitive recreation due to exploration for and development of oil and gas resources. However, it is not anticipated that any of the areas would lose their wilderness characteristics in totality because of the small amount of acreage projected to be disturbed and the few projected wells in this RFD area over the 15 year scenario.

In the Eastern Paradox RFD area, all fourteen non-WSA wilderness characteristics areas would remain open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (133,462 acres). However, 4,948 acres in Beaver Creek (19%), 1,097 acres in Fisher Towers (6%), 337 acres in Millcreek (10%), 110 acres in Negro Bill Canyon (5%), and

840 acres in Westwater Canyon (36%), would be under a no-surface occupancy stipulation or closed to leasing). Based on the percentage of non-WSA lands with wilderness characteristics and/or the existing leases within those areas, the highest potential for leasing and/or development would be in Beaver Creek, Desolation Canyon, Dome Plateau, Floy Canyon, Fisher Towers, Mary Jane Canyon and Lost spring Canyon. Floy Canyon would have the highest probability for development based on existing leases. Given that the projection for drilling for oil and gas is two wells/year for the whole RFD area, and that 24% of the RFD area encompasses non-WSA lands with wilderness characteristics open to leasing under standard stipulation, controlled surface use, or timing stipulations, up to one well per year—or up to 15 wells over a 15 year period—could be drilled within the non-WSA areas. This could disturb up to 15 acres per year, or up to 225 acres over the life of the plan. Leasing and development within these non-WSA areas could cause that portion to lose their natural character and opportunities for solitude and primitive recreation due to exploration for and development of oil and gas resources. However, it is not anticipated that any of the areas would lose their wilderness characteristics in totality because of the small amount of acreage projected to be disturbed and the few projected wells in this RFD area over the 15 year scenario.

In summary, up to 5 wells per/year or up to 75 wells over the 15 year RFD scenario, disturbing up to 75 acres/year or 1,125 acres over the 15 year RFD scenario could occur in non-WSA lands with wilderness characteristics. Thirteen of the 32 areas have a higher potential for these wells to be drilled based on existing leases and/or percentages of non-WSA lands within the RFD area.

Alternative B

Under Alternative B, all lands within the non-WSA lands with wilderness characteristics would be closed to leasing. However, existing leases still remain in 20 of the 32 non-WSA lands with wilderness characteristics areas. Development of these leases could compromise wilderness characteristics values in these areas. Below is a breakdown of how or where that may occur based on the RFD areas and the predicted surface disturbance for oil and gas activity for this alternative. Those non-WSA lands with wilderness characteristics that are not currently leased would be fully protected under the leasing closure under this alternative. This would preserve the naturalness of the areas and maintain the outstanding opportunities for primitive recreation and solitude.

In the Book Cliffs RFD area, all seven non-WSA wilderness characteristics areas have portions of the areas under existing leases comprising 28,277 acres. Based on the percentage of the non-WSA lands with wilderness characteristics under existing leases, the highest potential for development of those leases would be in Coal Canyon, Hideout Canyon, Mexico Point, or Hells Hole. Given that the projection for drilling for oil and gas is 4 wells/year for the whole RFD area under this alternative, and that 18% of the lands the RFD area encompasses are in non-WSA lands with wilderness characteristics that are leased, approximately one well per year—or up to 15 wells over a 15 year period—could be drilled within the non-WSA areas currently under lease. This could disturb up to 15 acres per year, or up to 225 acres over the life of the plan. The 15 year projection is on the high side, given that leases, if not developed or held in production, will expire after 10 years. Development of any leases within the non-WSA areas could cause that portion to lose their natural character and opportunities for solitude and primitive recreation due to exploration for and development of oil and gas resources. Because of the small amount of

acreage projected to be disturbed and the few projected wells in this RFD area over the 15 year scenario, it is anticipated that small portions of areas could loose their wilderness characteristics in any of the three large non-WSA lands with wilderness characteristics with existing leases. Far less than one-percent of any of those three area would be at risk of loss of wilderness characteristics. However, if all of the development over the 15 year period occurs in the smaller Hells Hole area, approximately 9% of that area could lose its wilderness characteristics.

In the Big Flat RFD area, eight of the eleven non-WSA wilderness characteristics areas have portions of the areas under existing leases comprising 10,127 acres. Based on the percentage of the non-WSA lands with wilderness characteristics under existing leases, the highest potential for development of those leases could be in Labyrinth Canyon, Hatch Wash or Goldbar. Given that the projection for drilling for oil and gas is 1 well/year for the whole RFD area under this alternative, and that 3% of the lands the RFD area encompasses are in non-WSA lands with wilderness characteristics that are leased, it is not anticipated that any well would be drilled within the non-WSA lands with wilderness characteristics. Thus, all lands would maintain and protect their wilderness characteristics values in this RFD area.

In the Eastern Paradox RFD area five out of the 14 non-WSA wilderness characteristics areas have portions of the areas under existing leases comprising 12,112 acres. The rest would all be closed to leasing (126,298 acres). Based on the percentage of the non-WSA lands with wilderness characteristics under existing leases, the highest potential for development of those leases could be in Dome Plateau and Floy Canyon. Given that the projection for drilling for oil and gas is 1 well/year for the whole RFD area under this alternative, and that 2% of the lands the RFD area encompasses are in non-WSA lands with wilderness characteristics that are leased, it is not anticipated that any wells would be drilled within the non-WSA lands with wilderness characteristics. Thus, all lands would maintain and protect their wilderness characteristics values in this RFD area.

In summary, up to 1 well per/year or up to 15 wells over the 15 year RFD scenario, disturbing up to 15 acres/year or 225 acres over the 15 year RFD scenario could occur on existing leased lands in non-WSA lands with wilderness characteristics. Three non-WSA areas in the Book Cliffs RFD area have the highest potential for these wells to be drilled based on existing leases in the non-WSA lands within the RFD area. All other non-WSA lands with wilderness characteristics would be protected from oil and gas leasing and developments activities by closing the areas to future leasing.

Alternative C

All or parts of the 28 of the 32 non-WSA lands with Wilderness Characteristics areas would remain all or partially open to leasing and development under standard oil and gas stipulations or under controlled surface use or timing limitation stipulations (160,522 acres). This comprises about 60% of non-WSA areas. Forty percent (105,963 acres) of the non-WSA lands with wilderness characteristics spread between 21 areas would be either closed to leasing or have a no surface occupancy stipulation on the leases. Four of those non-WSA lands with wilderness characteristics areas would be protected, in whole, from all surface disturbing activities: Beaver Creek, Gooseneck, Mill Creek Canyon, and Shafer Canyon.

In the Book Cliffs RFD area, all seven non-WSA wilderness characteristics areas would remain all or partially open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (58,766 acres). However, a total of 1,687 acres would be under a no-surface occupancy stipulation or closed to leasing in the following areas: 730 acres in Flume Canyon (21%) and 957 acres in Spruce Canyon (85%). Based on the percentage of non-WSA lands with wilderness characteristics and the existing leases within those areas, the highest potential for leasing and/or development would be in Coal Canyon, Hideout Canyon, Mexico Point, or Hells Hole. Because well projections under this alternative are the same as in Alternative A, and generally the same percentage of lands in the RFD area encompass non-WSA lands with wilderness characteristics, the same analysis portraying 3 wells in this area would be applied.

In the Big Flat-Hatch Point RFD area, nine of the eleven non-WSA wilderness characteristics areas would remain all or partially open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (33,970 acres). However a total of 32,464 acres would be under a no-surface occupancy stipulation in the following areas: 1,582 acres in Behind the Rocks (43%), 98 acres in Dead Horse Cliffs (12%), 6,064 acres in Goldbar (94%), 842 acres in Gooseneck (100%), 36 acres in Harts Point (2%), 1190 acres in Horsethief Point (14%), 2,855 acres in Hunter Canyon (64%), 17,954 acres in Labyrinth Canyon (71%), and 1,842 acres of Shafer Canyon (100%). Based on the percentage of non-WSA lands with wilderness characteristics and the existing leases within those areas, the highest potential for leasing and/or development would be in Labyrinth Canyon, Hatch Wash, or Goldbar. Given that the projection for drilling for oil and gas is 2 wells/year for the whole RFD area under this alternative, and that less than 9% of the lands the RFD area encompasses are in non-WSA lands with wilderness characteristics (not under a no-surface occupancy stipulation), it is not anticipated that any wells would be drilled within the non-WSA lands with wilderness characteristics. Thus, all lands would maintain and protect their wilderness characteristics values in this RFD area.

In the Eastern Paradox RFD area, twelve of the fourteen non-WSA wilderness characteristics areas would remain all or partially open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (66,594 acres). However, a total of 71,816 acres would be under a no-surface occupancy stipulation or closed to leasing in the following areas: 513 acres in Arches Adjacent (9%), 25,722 acres in Beaver Creek (100%), 985 acres in Desolation Canyon (10%), 9,580 acres in Dome Plateau (67%), 8,153 acres in Fisher Towers (47%), 45 acres in Lost Spring Canyon (<1%), 22,169 acres in Mary Jane Canyon (89%), 3,388 acres in Millcreek (100%), 1,177 acres in Negro Bill Canyon (50%), and 84 acres in Westwater Canyon (4%). Based on the percentage of non-WSA lands with wilderness characteristics and/or the existing leases within those areas, the highest potential for leasing and/or development would be in Desolation Canyon, Dome Plateau, Floy Canyon, and Lost Spring Canyon. Floy Canyon would have the highest probability for development based on existing leases. Given that the projection for drilling for oil and gas is 2 wells/year for the whole RFD area under this alternative, and that less than 12% of the lands the RFD area encompasses are in non-WSA lands with wilderness characteristics (not under a no-surface occupancy stipulation or closed to leasing), it is not anticipated that any wells would be drilled within the non-WSA lands with wilderness characteristics. Thus, all lands would maintain and protect their wilderness characteristics values in this RFD area.

In summary, up to 3 wells per/year or up to 45 wells over the 15 year RFD scenario, disturbing up to 45 acres/year or 675 acres over the 15 year RFD scenario could occur in non-WSA lands with wilderness characteristics, most likely within the Book Cliffs RFD area. However, eleven of the 32 areas have a higher potential for these wells to be drilled based on existing leases and/or percentages of non-WSA lands within the RFD area.

Alternative D

All or of the 32 non-WSA lands with Wilderness Characteristics areas would remain all or partially open to leasing and development under standard oil and gas stipulations or under controlled surface use or timing limitation stipulations (242,006 acres). This comprises about 91% of non-WSA areas. Nine percent (24,479 acres) of the non-WSA lands with wilderness characteristics spread between 16 areas would be have a no surface occupancy stipulation on the leases.

In the Book Cliffs RFD area, all seven non-WSA wilderness characteristics areas would remain open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (60,453 acres). Based on the percentage of non-WSA lands with wilderness characteristics and the existing leases within those areas, the highest potential for leasing and/or development would be in Coal Canyon, Hideout Canyon, Mexico Point, or Hells Hole. Because well projections under this alternative are the same as in Alternative A, and generally the same percentage of lands in the RFD area encompass non-WSA lands with wilderness characteristics, the same analysis portraying three wells in this RFD area would be applied.

In the Big Fat-Hatch Point RFD area, all eleven non-WSA wilderness characteristics areas would remain all or partially open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (62,291 acres). However a total of 4,573 acres would be under a no-surface occupancy stipulation in the following areas: 55 acres in Behind the Rocks (2%), 34 acres in Dead Horse Cliffs (4%), 543 acres in Goldbar (9%), 1162 acres in Horsethief Point (16%), 310 acres in Hunter Canyon (7%), 2,456 acres in Labyrinth Canyon (11%), and 13 acres of Shafer Canyon (<1%). Based on the percentage of non-WSA lands with wilderness characteristics and the existing leases within those areas, the highest potential for leasing and/or development would be in Labyrinth Canyon, Hatch/Lockhart/Hart, Hatch Wash, or Goldbar. Because well projections under this alternative are the same as in Alternative A, and generally the same percentage of lands in the RFD area encompass non-WSA lands with wilderness characteristics (16%), the same analysis portraying one well in this RFD area would be applied.

In the Eastern Paradox RFD area, all fourteen non-WSA wilderness characteristics areas would remain all or partially open to leasing under standard stipulations or under controlled surface use or timing limitation stipulations (118,498 acres). However, a total of 19,912 acres would be under a no-surface occupancy stipulation or closed to leasing in the following areas: 513 acres in Arches Adjacent (9%), 8,152 acres in Beaver Creek (32%), 250 acres in Desolation Canyon (2%), 6,390 acres in Dome Plateau (45%), 3,312 acres in Fisher Towers (19%), 946 acres in Mary Jane Canyon (4%), 69 acres in Millcreek (2%), 240 acres in Negro Bill Canyon (10%), and 40 acres in Westwater Canyon (2%). Based on the percentage of non-WSA lands with wilderness characteristics and/or the existing leases within those areas, the highest potential for leasing and/or development would be in Desolation Canyon, Dome Plateau, Floy Canyon, and

Lost Spring Canyon. Floy Canyon would have the highest probability for development based on existing leases. Because well projections under this alternative are the same as in Alternative A, and generally the same percentage of lands in the RFD area encompass non-WSA lands with wilderness characteristics (21%), the same analysis portraying one well in this RFD area would be applied.

In summary, like Alternative A, up to 5 wells per/year or up to 75 wells over the 15 year RFD scenario, disturbing up to 75 acres/year or 1,125 acres over the 15 year RFD scenario could occur in non-WSA lands with wilderness characteristics. Twelve of the 32 areas have a higher potential for these wells to be drilled based on existing leases and/or percentages of non-WSA lands within the RFD area.

4.3.8.2.5.2 Coal-bed Methane

Alternatives A, C, and D

In the Book Cliffs RFD area is the potential for coal-bed methane development in Hells Hole, Hideout Canyon, and Mexico Point non-WSA lands with wilderness characteristics. Predictions of up to 225 cumulative acres of disturbance from 15 wells over the 15 year RFD scenario is anticipated for an area three times as large as the non-WSA lands together. Due to the large area of potential development for coal-bed methane in the northeastern corner of the MPA, one 5-spot well cluster, and up to 75 acres maybe disturbed within these areas over the next 15 years. The impacts to wilderness characteristics from coal-bed methane leasing and development would be the same as described for oil and gas leasing and development. Leasing would be subject to the same stipulations as oil and gas leasing portrayed in on Table 4.53.

Alternative B

None of the areas would be leased for coal-bed methane under this alternative, thereby protecting the wilderness characteristics resource from that potential development.

In summary, Alternatives A and D would provide the most opportunities for oil and gas leasing and development to impact non-WSA lands with wilderness characteristics. In both alternatives, projections of up to five wells per year, or 75 wells over the 15 year RFD scenario could occur. This would cause surface disturbance and impact naturalness and outstanding opportunities for primitive recreation and solitude on up to 75 acres per year or up to 1,125 acres over the 15 year spread.

Under Alternative B, although all areas would be closed to leasing, projected development tied to valid existing leases could allow for up to one well a year to be developed on non-WSA lands with wilderness characteristics. This could have surface impacts on up to 15 acres a year or up to 225 acres over the 15 year RFD scenario. Statistics show that this development is most probable in the Coal Canyon, Hells Hole, Hideout Canyon, or Mexico Point areas.

Alternative C would allow opportunities for up to three oil and gas wells to be developed in the non-WSA lands with wilderness characteristics areas. This could disturb up to 45 acres per year of surface disturbance, and up to 675 acres of surface disturbance over the 15 year RFD scenario.

Although oil and gas well development would cause surface disturbing activities that may result in loss of wilderness characteristics in some areas, it is not expected under any alternative that the amount of disturbance based on well projections and the scattered nature of the wells would be substantial. Although small acreages may be lost in some of the non-WSA lands with wilderness characteristic, it is not predicted that any of the areas would lose the wilderness characteristics value in whole.

4.3.8.2.5.3 Potash Leasing

Alternatives A and D

Only the southernmost portion of the Goldbar non-WSA area with wilderness characteristics is intersected with a known potash leasing area. Under Alternatives A and D, this area could be leased and developed for potash. Approximately 15% of the Goldbar area would lose its wilderness characteristics if developed for potash.

Alternatives B and C

Under these alternatives the integrity of the wilderness characteristics would be protected from surface disturbing mining activities for potash because the area would be closed to leasing under Alternative B, and under a no-surface-occupancy stipulation under Alternative C.

4.3.8.2.5.4 Salable Minerals

Alternatives A and D

Although salable mineral disposal is a discretionary decision, there is potential for expansion of existing salable mineral disposal sites that could encroach into four non-WSA areas with wilderness characteristics: Horsethief Point, Goldbar, Behind the Rocks, and Mary Jane Canyon. These areas remain available for salable mineral disposal under Alternatives A and D. There is one sand and gravel site near the northernmost boundary of Horsethief Point, one building stone site near the southernmost boundary of Goldbar, three sand and gravel sites and one building stone site on the boundary of Behind the Rocks, and two sand and gravel sites on the boundary of Mary Jane Canyon that could expand into small portions of these areas. Where surface disturbance would occur, naturalness and opportunities for primitive recreation and solitude would be foregone.

Only minimal acreage within the non-WSA areas would be affected by surface disturbing mineral disposal activities because the existing sites area on the boundaries of these areas, and quarries or sand and gravel operations could expand in other directions as well. If the gravel pits or building rock quarries have associated support facilities, including roads and powerlines, additional soil and vegetation disturbance and the presence of permanent structures would degrade the natural characteristics of non-WSA lands with wilderness characteristics. The noise of the operations of sand and gravel pits or rock quarries, including the presence of work crews, vehicles, and equipment, would degrade opportunities for solitude and conflict with primitive recreational opportunities in proximity to industrial development. As recreational visitors move away from the sources of development, the sights and sounds of development would diminish.

However, it can be expected that sights and sounds from development would reduce opportunities for solitude and primitive and unconfined recreation up to 1/2 mile beyond the direct loss of natural character, depending on topography. Up to five acres in each of these areas could loose their wilderness characteristics by future expansion of the existing sites.

Alternative B

All non-WSA lands with wilderness characteristics would be closed to salable mineral disposal, thereby protecting the wilderness values of the four areas that contain the salable mineral sources.

Alternative C

Only two of the four non-WSA lands with wilderness characteristics as described in Alternative A above would be open to salable minerals: one sand and gravel site at Horsethief Point, and three sand and gravel sites and one building stone area in Behind the Rocks non-WSA areas with wilderness characteristics. Where development would occur, the same impacts as described in alternative A would ensue.

4.3.8.2.5.5 Locatable Minerals

All Alternatives

There are eight non-WSA lands with wilderness characteristics areas that are located within moderate potential areas for uranium and vanadium: Arches Adjacent, Beaver Creek, Behind the Rocks, Goldbar, Gooseneck, Horsethief Canyon, Labyrinth Canyon, and Yellow Bird. Most of the uranium/vanadium development is expected to occur within the historic mining areas with high development potential, which are outside of the non-WSA lands with wilderness characteristics. However, if new mining development does occur within these areas, direct loss of wilderness characteristics would be unavoidable due to major surface disturbing activities. Although Behind the Rocks non-WSA lands would be within an ACEC under Alternatives B and C, and thus would provide for some mitigative actions, surface disturbance from mining would still occur.

Existing mining claims currently overlay Floy Canyon, Goldbar, Dome Plateau, Beaver Creek, Hatch/Lockhart, and Hatch Wash. To date, there has been no activity associated with the claims within the non-WSA areas. New mining claims are filed continually, however, and changes could occur that would impact lands with wilderness characteristics by denuding the naturalness, and creating loss of primitive recreation activities and solitude for those areas where new mining activities may occur.

4.3.8.2.6 Impacts of Non-WSA Lands with Wilderness Characteristics Decisions on Non-WSA Lands with Wilderness Characteristics

There are 32 areas (outside of existing wilderness study areas [WSAs]) totaling 266,485 acres, that were found to have wilderness characteristics. See Tables 3.16 and 3.17 for a list of non-WSA areas with wilderness characteristics by name and acreage.

4.3.8.2.6.1 Alternatives A and D

Under these alternatives, there are no specific actions prescribed to directly protect or enhance the naturalness and opportunities for solitude or primitive recreation of the non-WSA areas. Thus, numerous allocations and uses could detract from the natural character or opportunities for solitude or primitive recreation of the non-WSA areas.

4.3.8.2.6.2 Alternative B

Under Alternative B, all non-WSA lands with wilderness characteristics would be managed with the following prescriptions:

- Visual resource management (VRM) Class II objectives.
- Limited to Designated Road and Trails for off-highway vehicle (OHV) use.
- Closed to oil and gas leasing.
- Closed to disposal of mineral materials.
- Retain public lands in Federal ownership.
- Rights-of-way exclusion area.
- Closed to commercial and personal-use wood cutting
- Closed to new road construction.

This prescription would prevent road construction and surface disturbances that would degrade the natural character of the non-WSA areas, prevent surface disturbances and uses that would be incompatible with primitive recreation activities, and protect the setting needed to support the experience of solitude. This management prescription would protect the natural character of all of the non-WSA lands, and the opportunities for solitude or primitive recreation that exist within these areas.

4.3.8.2.6.3 Alternative C

There are 47,761 acres within Beaver Creek (25,722 acres), Fisher Towers (5,540 acres), and Mary Jane Canyon (16,499 acres) non-WSA lands with wilderness characteristics that would be managed to protect their wilderness characteristics through the following prescriptions:

- Visual resource management (VRM) Class II objectives.
- Limited to Designated Road and Trails for off-highway vehicle (OHV) use.
- Closed or No Surface Occupancy stipulation for oil and gas leasing.
- Closed to disposal of mineral materials.
- Retain public lands in Federal ownership.
- Rights-of-way avoidance area.
- Closed to commercial and personal-use wood cutting
- Closed to new road construction.

This prescription, although not as restrictive as Alternative B, would still prevent new road construction and surface disturbances that would degrade the natural character of the non-WSA areas, prevent surface disturbances and uses that would be incompatible with primitive recreation activities, and protect the setting needed to support the experience of solitude. This management prescription would protect the natural character of all of the non-WSA lands, and the opportunities for solitude or primitive recreation that exist within these areas.

For the other 218,724 acres of non-WSA lands with wilderness characteristics, there are no specific actions prescribed to directly protect or enhance the naturalness and opportunities for solitude or primitive recreation of the non-WSA areas. Thus, numerous allocations and uses could detract from the natural character or opportunities for solitude or primitive recreation of the non-WSA areas.

In summary, Alternatives A, and D prescribe no specific management prescriptions would protect the naturalness or opportunities for solitude or primitive recreation of non-WSA lands. Alternative B however, would prescribe a management scheme that would protect the naturalness and opportunities for solitude or primitive recreation of all of the non-WSA lands (266,485 acres). Alternative C would manage three areas (47,761 acres) to protect their wilderness characteristics to protect naturalness and opportunities for solitude and primitive recreation in those areas.

4.3.8.2.7 Impacts of Paleontology Decisions on Non-WSA Lands with Wilderness Characteristics

4.3.8.2.7.1 Alternative A

Petrified wood gathering in Gooseneck, Goldbar, Dome Plateau, Mary Jane Canyon and Fisher Towers non-WSA lands with wilderness characteristics would continue to be allowed along the Colorado Riverway Special Recreation management areas, including commercial sales of this resource. This could impact the wilderness characteristics values by detracting from naturalness due to surface disturbance and affecting primitive recreational opportunities and solitude from commercial activities.

4.3.8.2.7.2 Alternatives B, C, and D

Petrified wood gathering and in Gooseneck, Goldbar, Dome Plateau, Mary Jane Canyon and Fisher Towers, would be prohibited within the Colorado Riverway Special Recreation Management Area to protect resources for future public enjoyment. In addition commercial sales of petrified wood would not be permitted. These decisions would maintain the wilderness characteristics of the areas. Like cultural resources, knowing more about the paleontological resources of the area, interpreting the resource in an appropriate fashion, and viewing fossil sites in the non-WSA lands with wilderness characteristics would add to the enjoyment of these areas for primitive recreational purposes. And protection of fossils adds to the character of the setting that supports these recreational opportunities.

4.3.8.2.8 Effects of Recreation Decisions on Non-WSA Lands with Wilderness Characteristics

The MFO does not prescribe specific allocation and use decisions for other resources in designated SRMAs. Each alternative designates SRMAs based on different types of recreational uses and opportunities in concert with other goals and objectives for those alternatives.

4.3.8.2.8.1 Alternative A

Two designated SRMAs overlay all or portions of six non-WSA lands with wilderness characteristics. All other non-WSA lands would be managed as an Extensive Recreation Management Area (ERMA)

All of Hatch Wash, Harts Point, and Hatch/Lockhart non-WSA lands with wilderness characteristics lie within the Canyon Rims SRMA. Although the SRMA is much larger than those three areas, the primary objectives for management of these scenic and remote lands is in accordance with the MFO's Recreation Opportunity Spectrum (ROS) inventory. Both the Hatch Wash and Hatch/Lockhart areas were inventoried as semi-primitive non-motorized areas primarily for hiking and backpacking opportunities within the canyons. Harts Point non-WSA wilderness characteristics area was inventoried as a roaded natural area for the opportunity of auto touring on primary roads and visiting scenic overlooks into the Colorado River canyon and Canyonlands National Park. The SRMA opportunities would protect the natural landscape and opportunities for solitude and primitive forms of recreation in all three areas, however, motorized vehicle use of designated routes in the Harts Point area would temporarily disrupt opportunities for solitude and conflict with primitive forms of recreation.

The Colorado River SRMA envelopes a portion of the Dome Plateau and Westwater Canyon non-WSA areas for a 1/2 mile on either side of the Colorado River, and a portion of the Beaver Creek non-WSA area along the Dolores River. The purpose of this SRMA is to focus on boating and river rafting opportunities and to preserve these areas for non-motorized primitive recreation opportunities. The SRMA recreational management focus would protect the natural landscape and opportunities for solitude and primitive forms of recreation in all three areas.

None of the other 26 non-WSA lands with wilderness characteristics are within SRMAs under this alternative, therefore, there would be no recreational management objectives or focus within those areas. Because these lands are not within a managed SRMA with specific recreation objectives, they would be vulnerable to surface disturbing uses including commercial permitting activities, special recreation permits, new road construction, and other activities that could impact the natural values and primitive recreational opportunities and solitude that currently exist in those areas.

4.3.8.2.8.2 Alternative B

All portions of 21 non-WSA lands with wilderness characteristics, and portions of seven others would be within eight designated SRMAs. Only four non-WSA land areas (Lost Spring, Granite

Creek, Big Triangle, and Yellow Bird) would not be within a designated SRMA for focused recreation management.

The Bookcliffs SRMA includes all of Hideout Canyon, Mexico Point, Hells Hole and portions of Desolation Canyon (90%), Floy Canyon (45%), and Coal Canyon (5%). This SRMA would be managed as an undeveloped SRMA for non-motorized recreation use, including hiking and backpacking, among others. No motorized permits would be authorized. The primitive recreation setting of this large SRMA would enhance and preserve the non-WSA lands with wilderness characteristics.

The Canyon Rims SRMA incorporates all of Hatch Wash, Harts Point, and Hatch/Lockhart non-WSA areas. A focus area for non-mechanized recreation lies in Hatch Wash, which prioritizes this area for hiking and backpacking opportunities. Designated motorized routes to scenic vistas are near the Harts Point non-WSA area. The recreational management within this SRMA would maintain and preserve the wilderness characteristics in these three non-WSA areas.

The Colorado Riverway SRMA includes all of Fisher Towers, Shafer Canyon, and portions of Dome Plateau (60%), Negro Bill (50%), and Mary Jane Canyon (90%). The main recreational emphasis in this SRMA would be to manage camping, boating, river access, trails, among others things, to protect the outstanding resource values of the area. Approximately half of the lands in Fisher Towers and 80% of the lands in Mary Jane Canyon would be non-motorized recreation focus areas. The priorities within these areas would be for hiking, climbing, and equestrian use. All of Negro Bill Canyon would be within a hiking and ecological study focus area and would be restricted to day use only. Managed recreation in these non-WSA lands with wilderness characteristics would help maintain and protect the natural character of the areas and provide for solitude and primitive recreation opportunities.

The Dolores River Canyons SRMA envelops all of the Beaver Creek non-WSA lands with wilderness characteristics. It would be managed as an undeveloped SRMA with focus on non-motorized boating, day hiking, and backpacking. Its remote setting would continue to protect and enhance wilderness characteristics values.

The Labyrinth Rims/Gemini Bridges SRMA includes all of Labyrinth Canyon, Goldbar, Horsethief, and Dead Horse Cliffs non-WSA lands with wilderness characteristics, and portions of Arches Adjacent non-WSA lands (25%). The major recreational management attention needed within this large area centers on river permitting, hiking and backpacking, camping, and motorized activities. Most of Goldbar non-WSA area would be a focus area for hiking to enjoy the scenic values of the area. Areas along the Green River (within the Labyrinth Canyon non-WSA area) would be a designated focus area for canoeing. The Labyrinth Canyon non-WSA area would also include a recreational focus area for hiking within Spring Canyon. All of these activities would help promote and maintain the wilderness characteristics values in these areas. Within the portion of Arches Adjacent non-WSA land with wilderness characteristics are two focus areas for mountain bike use. Although not a motorized use, mountain biking in those areas may detract from, and be in conflict with, solitude and a primitive recreation experience.

The Sand Flats SRMA incorporates the southern portion of Negro Bill Canyon non-WSA lands with wilderness characteristics (50%). Within this area, the Moab Slickrock Bike Trail would be closed to all motorized use which would enhance the experience of solitude. Mountain bikes would still be prevalent in the area which may detract from, and be in conflict with, a primitive recreation experience.

The South Moab SRMA incorporates all of the Mill Creek Canyon and Behind the Rocks non-WSA lands with wilderness characteristics. The recreation objective for these lands within the SRMA is to create a focus area for primitive hiking experiences. The recreational management within this SRMA would maintain and preserve the wilderness characteristics in these three non-WSA areas.

The Two Rivers SRMA includes a portion of the Westwater Canyon non-WSA lands with wilderness characteristics along the Colorado River (10%). The overall goal of this SRMA is to provide high quality opportunities for recreational boating and camping, and to protect the outstanding resource values. In the portion overlying the Westwater Canyon non-WSA area, the emphasis is for hiking and whitewater boating in a very primitive and remote setting. Managed recreation in these non-WSA lands with wilderness characteristics would preserve the natural character of the areas and provide for solitude and outstanding primitive recreation opportunities.

Those non-WSA lands with wilderness characteristics that are not within an SRMA would be managed under an ERMA for recreational objectives. Because all of the non-WSA lands with wilderness characteristics are protected by restrictive management prescriptions under this alternative, all of the wilderness characteristics values would continue to be preserved under this alternative, whether or not they are in an SRMA.

4.3.8.2.8.3 Alternative C

All portions of 17 non-WSA lands with wilderness characteristics, and portions of five others would be within seven designated SRMAs. Ten non-WSA land areas (Floy Canyon, Coal Canyon, Hideout Canyon, Desolation Canyon, Mexico Point, Hideout Canyon, Lost Spring, Granite Creek, Big Triangle, and Yellow Bird) would not be wholly or partially within a designated SRMA for focused recreation management.

The analysis of SRMAs and their impacts on non-WSA lands with wilderness characteristics would generally be the same as in Alternative B with the following changes:

- The Bookcliffs SRMA, which includes all of Hideout Canyon, Mexico Point, Hell's Hole and portions of Desolation Canyon, Floy Canyon, and Coal Canyon, would not be designated an SRMA. It would be managed under an Extensive Recreation Management Area.
- Only about 60% of the Fisher Towers non-WSA lands with wilderness characteristics would be incorporated into the Colorado Riverway SRMA. The remaining portion of the area would be managed under an Extensive Recreation Management Area.

All of the remaining non-WSA lands with wilderness characteristics that are not within SRMAs under this alternative would be managed under an ERMA, with no specific recreational management focus within those areas. Although the Bookcliffs SRMA would not be designated

under this alternative, specific management for the ERMA would be the same as for the SRMA (non-mechanized recreation, especially equestrian use, hiking, backpacking and hunting. New constructed routes would not be allowed, and commercial motorized permits would not be issued, and competitive events would not be allowed). Thus, the impacts of maintaining this area under an ERMA would be the same as for an SRMA for wilderness characteristics values.

The other lands that are not within a managed SRMA with specific recreation objectives would be vulnerable to surface disturbing uses, including commercial permitting activities, special recreation permitting, new road construction, and other activities that could impact the natural values and primitive recreational opportunities and solitude that currently exist in those areas.

4.3.8.2.8.4 Alternative D

All of five and portions of five more non-WSA lands with wilderness characteristics would be within four designated SRMAs. All other non-WSA lands with wilderness characteristics would be managed under an ERMA.

The Canyon Rims SRMA and Sand Flats SRMA would remain the same as in Alternative B and C. For those non-WSA lands with wilderness characteristics that remain with SRMAs under this alternative, the impacts of their designation on non-WSA lands with wilderness characteristics would be the same as in Alternative B. The following differences from Alternative B would be in place:

- The Bookcliffs SRMA, which includes all of Hideout Canyon, Mexico Point, Hell's Hole and portions of Desolation Canyon, Floy Canyon, and Coal Canyon, would not be designated an SRMA.
- Only about 55% of the Fisher Towers non-WSA lands with wilderness characteristics would be incorporated into the Colorado Riverway SRMA.
- The Dolores River Canyons SRMA would not be designated an SRMA. A narrow portion along the Dolores River with the Beaver Creek non-WSA lands with wilderness characteristics would be incorporated into the Two River SRMA.
- The Labyrinth Rims/Gemini Bridges SRMA, which includes all of Labyrinth Canyon, Goldbar, Horsethief, and Dead Horse Cliffs non-WSA lands with wilderness characteristics, and portions of Arches Adjacent non-WSA lands would not be designated an SRMA.
- The South Moab SRMA, which incorporates all of the Mill Creek Canyon and Behind the Rocks non-WSA lands with wilderness characteristics would not be designated an SRMA.
- The Two Rivers SRMA would include the Dolores River within the Beaver Creek non-WSA lands with wilderness characteristics, as well as the portion of the Westwater Canyon non-WSA lands with wilderness characteristics along the Colorado River.

All of the remaining non-WSA lands with wilderness characteristics that are not within SRMAs under this alternative would be managed under an ERMA, with no specific recreational management focus within those areas. Although the Bookcliffs SRMA would not be designated under this alternative, specific management for the ERMA would be the same as for the SRMA (non-mechanized recreation, especially equestrian use, hiking, backpacking and hunting. New

constructed routes would not be allowed, and commercial motorized permits would not be issued, and competitive events would not be allowed). Thus, the impacts of maintaining this area under an ERMA would be the same as for an SRMA for wilderness characteristics values.

For the other lands that are not within a managed SRMA with specific recreation objectives, they would be managed as an ERMA and be vulnerable to surface disturbing uses, including special recreation permitting, commercial permitting activities, new road construction, and other activities that could impact the natural values and primitive recreational opportunities and solitude that currently exist in those areas.

4.3.8.2.9 Impacts of Riparian Decisions on Non-WSA Lands with Wilderness Characteristics

4.3.8.2.9.1 Common to All Alternatives

All non-WSA lands with wilderness characteristics contain riparian ecosystems, except for the Hatch/Lockhart non-WSA area. The objective of riparian management is to manage riparian areas for properly functioning condition and to avoid or minimize loss or degradation of riparian, wetland and associated floodplains so as to preserve and enhance natural and beneficial values and provide for fish, wildlife, and special status species habitats. Decisions to implement any of these objectives would improve the natural vegetation condition of non-WSA lands with wilderness characteristics, and thus its natural values. Improved riparian and wetland condition would enhance wildlife habitat, and thus, the natural values of non-WSA lands. Further, improved wildlife habitat would lead to increases in riparian obligate wildlife species populations and opportunities for wildlife viewing. And, improved riparian and wetland condition would improve the setting for other primitive recreational opportunities, including hiking, camping, and nature study.

4.3.8.2.9.2 Alternative A

Under the No Action alternative, there are no specific decisions to prevent surface-disturbing activities within 100-year floodplains or riparian areas or springs. In addition, lands with these scarce resources would also be available for disposal. Allowing surface-disturbing activities within non-WSA lands with wilderness characteristics would degrade the wilderness characteristics values, especially that of naturalness. Depending on the extent of activity in riparian areas, the primitive recreation experience could also be diminished.

4.3.8.2.9.3 Alternatives B, C, and D

Under these action alternatives, prohibiting surface disturbing activities within active floodplains or within 100 meters of riparian areas or springs would help restore cottonwood, willow, and other riparian species along major riparian and wetland areas.

4.3.8.2.10 Impacts of Soils/Watershed Decisions on Non-WSA Lands with Wilderness Characteristics

4.3.8.2.10.1 Alternative A

Under the No Action Alternative, there are no specific decisions to prevent surface-disturbing activities within 100-year floodplains or riparian areas or springs, nor are there slope restrictions for surface-disturbing activities, especially associated with oil and gas development. Because there are no restrictions on OHVs or construction of new routes in the Bookcliffs area, sensitive saline soils would continue to be disturbed. This would impact the natural character of the Floy and Coal Canyons non-WSA lands with wilderness characteristics. Depending on the level of development or disturbance in these areas, solitude and primitive recreation opportunities could by foregone.

4.3.8.2.10.2 Common to All Action Alternatives (B, C and D)

Decisions under these alternatives would prohibit surface-disturbing activities within 100 year floodplains, or within 100 meters of natural springs. They would also preclude new OHV routes from being designated in saline soil areas, which include Floy and Coal Canyons. Applying these decisions would help maintain the natural values in these areas.

4.3.8.2.10.3 Alternatives B and C

The Mill Creek–Spanish Valley watershed would be closed to surface disturbing activities to protect the aquifer for the Moab area. Protection of the watershed would preserve and enhance the natural character and opportunities for primitive forms of recreation present in the Mill Creek non-WSA area.

4.3.8.2.11 Impacts of Special Designation Decisions on Non-WSA Lands with Wilderness Characteristics

For the purposes of this section of the analysis, "Special Designations" include Areas of Critical Environmental Concern (ACECs) established under each alternative, rivers recommended eligible in Alternative A and suitable for inclusion in the National Wild and Scenic Rivers System under the three action alternatives, and wilderness study areas (WSAs) being managed to protect their wilderness characteristics under each alternative.

4.3.8.2.11.1 Alternative A

Under the No Action alternative there would be no ACECs designated, therefore specific decisions that may protect the wilderness characteristics in non-WSA lands with those values would not be afforded through ACEC designation.

Under this alternative, seven of the 32 non-WSA land areas intersect with eligible wild and scenic river segments, totaling 43.66 miles in those seven areas. There are 7.7 miles of Beaver Creek, 12.15 miles of the Dolores River, 2.06 miles of Onion Creek, 7.1 miles of the Green

River, 12.47 miles of Professor Creek, 3.09 miles of Mill Creek, 0.08 miles of Negro Bill Creek, and 0.08 miles of Cottonwood that would be managed to preserve their wild and scenic river eligibility. Protection of river values (pending future suitability studies) would prevent uses and surface disturbances that would detract from the natural character of the Beaver Creek, Fisher Towers, Labyrinth Canyon, Mary Jane Canyon, Mill Creek Canyon, Negro Bill Canyon, and Spruce Canyon non-WSA lands with wilderness characteristics within the 1/2 mile river corridor (1/4 mile on each side of the river segment). The presence and noise of motor boat use along the Green River in Labyrinth Canyon non-WSA lands would reduce opportunities for solitude and conflict with primitive recreation in these river segments. The impacts would last while motorized boats were present.

Because Alternative A does not propose specific management to protect non-WSA lands with wilderness characteristics, contiguous WSAs and National Park Service lands would not have expanded opportunities for solitude and primitive forms of recreation afforded to them.

4.3.8.2.11.2 Alternative B

Of the 14 ACECs that would be designated under this alternative to protect a variety of relevant and important values, 9 ACECs would overlay non-WSA lands with wilderness characteristics. Those ACECs are Behind the Rocks, Bookcliffs, Canyon Rims, Colorado River Corridor, Cottonwood-Diamond Watershed, Highway 279/Shafer Basin/Long Canyon, Labyrinth Canyon, Mill Creek Canyon, and Ten Mile Wash. The management prescriptions for these ACECs would protect naturalness and opportunities for solitude and primitive recreation in all of the non-WSA lands.

Portions of the Behind the Rocks (1,460 acres) and Hunter Canyon (2,771 acres) non-WSA lands with wilderness characteristics lie within the 17,836-acre potential Behind the Rocks ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, closed to woodcutting, limited to designated routes for OHV use, preclude vegetation treatments, and managed by VRM Class I objectives (preserve the characteristic landscape). These prescriptions would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation.

Portions of Coal Canyon (6,854 acres), Desolation Canyon (8,970 acres), Floy Canyon (3,921 acres), Spruce Canyon (1,120 acres), and Mexico Point (23 acres) non-WSA lands with wilderness characteristics lie within the 304,252 acre potential Bookcliffs ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, closed to woodcutting, limited to designated routes for OHV use, and managed by VRM Class II objectives (retention of the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation

Almost all of Harts Point (1,465 acres) and Hatch/Lockhart (2,027 acres) non-WSA lands with wilderness characteristics lies within the 23,400 acres potential Canyon Rims ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, closed to woodcutting, limited to designated routes for OHV use, and managed by VRM Class II objectives (retention of the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation

Portions of Dome Plateau (9,598 acres), Fisher Towers (6,466 acres), Mary Jane Canyon (17,305 acres), and Negro Bill Canyon (9 acres) non-WSA lands with wilderness characteristics lie within the 50,483 acres potential Colorado River Corridor ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, closed to woodcutting, limited to designated routes for OHV use, preclude vegetation treatments, and managed by VRM Class I objectives (preserve the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation.

Portion of Flume Canyon (730 acres) and Spruce Canyon (960 acres) non-WSA lands with wilderness characteristics lie within the 35,830 acres potential Cottonwood Diamond Watershed ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, closed to OHV use at end of the Class B-road system, and managed by VRM Class II objectives (retention of the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation.

Portions of Dead Horse Cliffs, (784 acres), Goldbar (35 acres), and all of Gooseneck (843 acres) and Shafer Canyon (1,842 acres) non-WSA lands with wilderness characteristics lie within the 13,500 acre potential Highway 279/Shafer Basin/Long Canyon ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, limited to designated routes for OHV use, and managed by VRM Class I objectives (preserve the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation

Portions of Labyrinth Canyon (5,204 acres) and Horsethief Point (739 acres) non-WSA lands with wilderness characteristics lie within the 8,528 acre potential Labyrinth Canyon ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, limited to designated routes for OHV use, closed to firewood cutting, and managed by VRM Class I objectives (preserve the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The

occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation.

Portions of Mill Creek Canyon (2,335 acres) non-WSA lands with wilderness characteristics lie within the 13,501 acre potential Mill Creek Canyon ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, limited to designated routes for OHV use, closed to firewood cutting, and managed by VRM Class I objectives (preserve the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation.

A small portion of Labyrinth Canyon (232) non-WSA lands with wilderness characteristics lies within the 4,908 acre potential Ten Mile Wash ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, limited to designated routes for OHV use (no routes designated), and closed to firewood cutting. This prescription would prevent surface disturbances and preclude motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation.

Under this alternative, seven of the 32 non-WSA land areas intersect with suitable wild and scenic river segments, totaling 43.66 miles in those seven areas. There are 7.7 miles of Beaver Creek, 12.15 miles of the Dolores River, 2.06 miles of Onion Creek, 7.1 miles of the Green River, 12.47 miles of Professor Creek, 3.09 miles of Mill Creek, 0.08 miles of Negro Bill Creek, and 0.08 miles of Cottonwood that would be managed for wild and scenic river designation with segment classifications of "scenic," "recreational" and "wild" (see Table 2.1). Protection of river values (until Congress acts on BLM's recommendations) would prevent uses and surface disturbances that would detract from the natural character of the Beaver Creek, Fisher Towers, Labyrinth Canyon, Mary Jane Canyon, Mill Creek Canyon, Negro Bill Canyon, and Spruce Canyon non-WSA lands with wilderness characteristics within the 1/2 mile river corridor (1/4 mile on each side of the river segment). The presence and noise of motor boat use along the Green River in Labyrinth Canyon non-WSA lands would reduce opportunities for solitude and conflict with primitive recreation in these river segments. The impacts would last while motorized boats were present.

Managing the wilderness study areas (WSAs) under BLM's Interim Management Policy to protect their wilderness values would expand opportunities for solitude and primitive forms of recreation, found in the Behind the Rocks, Coal Canyon, Desolation Canyon, Floy Canyon, Flume Canyon, Lost Spring Canyon, Mill Creek Canyon, Negro Bill Canyon, Spruce Canyon, and Westwater Canyon non-WSA lands with wilderness characteristics, to larger land areas, including both the WSAs and contiguous non-WSA lands with wilderness characteristics. In addition, Yellowbird, Lost Spring Canyon, Dome Plateau, and Arches Adjacent non-WSA lands with wilderness characteristics are contiguous with Arches National Park; and Dead Horse Cliffs, Shafer Canyon, Gooseneck, and Horsethief Point non-WSA lands with wilderness characteristics are contiguous with Canyonlands National Park. Similar to the WSAs, protecting

the non-WSA lands with wilderness characteristics to preserve their wilderness values would enhance and expand the opportunities for solitude and primitive recreation.

4.3.8.2.11.3 Alternative C

Of the 5 ACECs that would be designated under this alternative to protect a variety of relevant and important values, all 5 ACEC s would overlay some portions of non-WSA lands with wilderness characteristics. Those ACECs are Behind the Rocks, Cottonwood Diamond Watershed, Highway 279/Shafer Basin/Long Canyon, Mill Creek Canyon, and Ten Mile Wash. The non-WSA lands and their acreages that intersect with these five ACECs are the same as those in Alternative C. Management prescriptions for the non-WSA lands with wilderness characteristics within the ACECs are slightly different, however, than in Alternative C. This is because VRM Class II objectives (retention of the characteristic landscape) have been applied in most areas, and the non-WSA lands would have a no surface occupancy stipulation (NSO) for oil and gas leasing. The VRM Class II objectives and the NSO stipulation would preclude surface disturbing activities, thereby protecting naturalness and opportunities for solitude and primitive recreation in all of the non-WSA lands.

Portions of the Behind the Rocks (1,460 acres) and Hunter Canyon (2,771 acres) non-WSA lands with wilderness characteristics lie within the 5,201-acre potential Behind the Rocks ACEC. These non-WSA lands with wilderness characteristics would have a no surface occupancy (NSO) stipulation for oil and gas leasing, closed to woodcutting, limited to designated routes for OHV use, preclude vegetation treatments, and managed by VRM Class II objectives (retention of the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation

Portion of Flume Canyon (730 acres) and Spruce Canyon (960 acres) non-WSA lands with wilderness characteristics lie within the 34,027 acre potential Cottonwood-Diamond Watershed ACEC. These non-WSA lands with wilderness characteristics would be NSO for oil and gas leasing and closed to OHV use at end of the Class B-road system. This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation.

Portions of Dead Horse Cliffs, (784 acres), Goldbar Canyon (35 acres), and all of Gooseneck (843 acres) and Shafer Canyon (1,842 acres) non-WSA lands with wilderness characteristics lie within the 13,500 acre potential Highway 279/Shafer Basin/Long Canyon ACEC. These non-WSA lands with wilderness characteristics would be closed to oil and gas leasing, limited to designated routes for OHV use, and managed by VRM Class I and II objectives (preserve and retain the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence

and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation.

Portions of Mill Creek Canyon (2,335 acres) non-WSA lands with wilderness characteristics lie within the 3,721 acre potential Mill Creek Canyon ACEC. These non-WSA lands with wilderness characteristics would be NSO for oil and gas leasing, limited to designated routes for OHV use, closed to firewood cutting, and managed by VRM Class II objectives (retention of the characteristic landscape). This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation.

A small portion of Labyrinth Canyon (232) non-WSA lands with wilderness characteristics lies within the 4,980 acre potential Ten Mile Wash ACEC. These non-WSA lands with wilderness characteristics would be NSO for oil and gas leasing, limited to designated routes for OHV use, and closed to firewood cutting. This prescription would prevent surface disturbances and limit motorized uses and protect the natural character of the non-WSA lands with wilderness characteristics and opportunities for solitude and primitive recreation. The occasional presence and noise of OHV use would reduce opportunities for solitude and conflict with primitive forms of recreation.

Under this alternative, three of the 32 non-WSA land areas intersect with suitable wild and scenic river segments, totaling 16.00 miles in those three areas. There are 6.1 miles of the Dolores River, 2.8 miles of Onion Creek, and 7.1 miles of the Green River that would be managed for wild and scenic river designation with segment classifications of "scenic," "recreational" and "wild" (see Table 2.1). Protection of river values (until Congress acts on BLM's recommendations) would prevent uses and surface disturbances that would detract from the natural character of the Beaver Creek, Labyrinth Canyon, and Mary Jane Canyon non-WSA lands with wilderness characteristics within the 1/2 mile river corridor (1/4 mile on each side of the river segment). The presence and noise of motor boat use along the Green River in Labyrinth Canyon non-WSA lands would reduce opportunities for solitude and conflict with primitive recreation in these river segments. The impacts would last while motorized boats were present.

Because Alternative C does not propose specific management to protect non-WSA lands with wilderness characteristics contiguous to any WSAs or National Park Service lands, there would not be expanded opportunities for solitude and primitive forms of recreation afforded to the WSAs or National Park lands.

4.3.8.2.11.4 Alternative D

Under Alternative D, no ACECs would be designated; therefore, management prescriptions to protect relevant and important values would not be applied and would not afford protection of wilderness values in non-WSA lands with wilderness characteristics.

Under this alternative, no wild and scenic river segments would be found suitable. Therefore, management prescriptions to protect the suitable river segments would not be applied and would not afford protection of wilderness values in non-WSA lands with wilderness characteristics.

Because Alternative D does not propose specific management to protect non-WSA lands with wilderness characteristics, contiguous WSAs and National Park Service lands would not have expanded opportunities for solitude and primitive forms of recreation afforded to them.

In summary, Alternative B would provide the most long-term protection to the naturalness and opportunities for solitude and primitive recreation of non-WSA lands with wilderness characteristics by designating the most acres as ACEC and by recommending the longest stretches of waterways for protection in the National Wild and Scenic Rivers System, followed by Alternative C. Alternative C would provide some protection of the naturalness and opportunities for solitude and primitive recreation of non-WSA lands and recommend fewer river segments for protection in the National /Wild and Scenic Rivers System. Both Alternative A and D would provide the lowest level of protection, as neither one would designate ACECs or recommend suitable river segments for protection (although Alternative A does protect the eligible river segments for later study.)

4.3.8.2.12 Impacts of Special Status Species Decisions on Non-WSA Lands with Wilderness Characteristics

Under all alternatives, management actions would focus on maintaining, protecting, and enhancing habitats for special status species. Decisions that could help protect non-WSA lands with wilderness characteristics include avoiding construction of new roads within listed and non-listed special status plant and animal species habitats. This would help to maintain the natural character of non-WSA lands with wilderness characteristics where they intersect with special status species habitat. Another common to all alternatives decision is to implement habitat manipulations where translocations and population augmentation of special status species would occur. Depending on the methods used, this could degrade the naturalness of the non-WSA lands. During the time the habitat manipulation is being conducted, the opportunity for solitude and primitive recreation would be disrupted. Under all alternatives, a decision to implement management strategies that restore degraded riparian communities could, in the short term, affect the naturalness of the non-WSA lands with wilderness characteristics. Improvement of riparian condition, however, would also improve wildlife habitat for these species, improving wildlife viewing opportunities and the primitive recreational values of the non-WSA lands. In addition, any Recovery Plan actions that require fencing would introduce an unnatural element of human effects to the landscape, slightly degrading the natural condition of the non-WSA lands.

Restrictions on surface disturbing activities within the 100-year floodplain of the Colorado River for endangered fish would help protect the wilderness characteristics values in the Dome Plateau, Labyrinth Canyon, and Shafer Canyon non-WSA lands with wilderness characteristics by maintaining the natural character along the river corridor. In addition, surface disturbing restrictions in suitable *Cycladenia humilis* var. *jonesii* habitat would protect the natural character of Mary Jane Canyon and Fisher Towers non-WSA lands with wilderness characteristics.

Specific management actions for oil and gas leasing in special status species habitat under all alternatives are related to timing stipulations and/or controlled surface use stipulations. These stipulations would not protect non-WSA lands with wilderness characteristics from surface disturbance associated with oil and gas activities, impacting naturalness and opportunities for solitude and primitive recreation.

4.3.8.2.13 Impacts of Travel Management Decisions on Non-WSA Lands with Wilderness Characteristics

4.3.8.2.13.1 OHV Travel Management

Table 4.54 portrays all of the non-WSA lands with wilderness characteristics and displays how the OHV management would be applied under each alternative.

Table 4.54. OHV Management in Non-WSA Lands with Wilderness Characteristics

OHV Acres in non WSA Lands with Wilderness Characteristics by Alternative			Alternatives			
Name	Acres	OHV Category	A	B	C	D
Arches Adjacent	6396	Open	2500	0	0	0
		Limited	3896	6396	6396	6396
Beaver Creek	25722	Open	21366	0	0	0
		Limited	4356	25722	25722	25722
Behind the Rocks	3643	Open	5	0	0	0
		Limited	3638	3643	3643	3643
Big Triangle	5200	Open	5200	0	0	0
		Limited	0	5200	5200	5200
Coal Canyon	21632	Open	11099	0	0	0
		Limited	10533	21632	21632	21632
Dead Horse Cliffs	797	Open	25	0	0	0
		Limited	772	797	797	797
Desolation Canyon	10498	Open	10380	0	0	0
		Limited	118	10498	10498	10498
Dome Plateau	14207	Open	7853	0	0	0
		Limited	6354	14207	14207	14207
Fisher Towers	17235	Open	9550	0	0	0
		Limited	7685	17235	17235	17235
Floy Canyon	9983	Open	8339	0	0	0
		Limited	1644	9983	9983	9983
Flume Canyon	3520	Open	3520	0	0	0
		Limited	0	3520	3520	3520
Goldbar	6437	Limited	6437	6437	6437	6437

Table 4.54. OHV Management in Non-WSA Lands with Wilderness Characteristics

OHV Acres in non WSA Lands with Wilderness Characteristics by Alternative			Alternatives			
Name	Acres	OHV Category	A	B	C	D
Gooseneck	843	Limited	843	843	843	843
Granite Creek	4528	Open	4528	0	0	0
		Limited	0	4528	4528	4528
Harts Point (MFO)	1465	Limited	1465	1465	1465	1465
Hatch Wash	10983	Limited	10983	10983	10983	10983
Hatch/Lockhart	2670	Limited	2670	2670	2670	2670
Hells Hole	2538	Open	2538	0	0	0
		Limited	0	2538	2538	2538
Hideout Canyon	11607	Open	11607	0	0	0
		Limited	0	11607	11607	11607
Horsethief Point	8358	Limited	8358	8358	8358	8358
Hunter Canyon	4465	Limited	4465	4465	4465	4465
Labyrinth Canyon	25361	Open	2798	0	0	0
		Limited	22653	25361	25361	25361
Lost Spring Canyon	11456	Open	11456	0	0	0
		Limited	0	11456	0	0
Mary Jane Canyon	24779	Open	8046	0	0	0
		Limited	16733	24779	24779	24779
Mexico Point	12837	Open	12837	0	0	0
		Limited	0	12837	12837	12837
Mill Creek Canyon	3388	Open	402	0	0	0
		Limited	2986	3388	3388	3388
Negro Bill Canyon	2333	Open	1363	0	0	0
		Limited	970	2333	2333	2333
Shafer Canyon	1842	Limited	1842	1842	1842	1842
Spruce Canyon	1131	Open	1131	0	0	0
		Limited	0	1131	1131	1131
Westwater Canyon	3086	Open	1479	0	0	0
		Limited	1607	3086	3086	3086
Westwater Creek	7188	Open	7173	0	0	0
		Limited	15	7188	7188	7188
Yellow Bird	357	Open	331	0	0	0
		Limited	26	357	357	357

Alternative A

Under present management, cross-country motorized use is allowed for game retrieval and antler collection in areas open for motorized travel. The MFO also has the discretion to authorize cross-country travel for any commercial or organized group events. These actions would continue to degrade the natural character of the non-WSA lands with wilderness characteristics by allowing new surface disturbing activity from motorized vehicles, as well as conflict with solitude and primitive recreation experiences from the sights and sounds of vehicle travel.

Current management practices designate 145,521 acres (55%) in twenty-three of the 32 non-WSA lands with wilderness characteristics as open to cross-country travel (see Table 4.54). Cross country motorized travel in these non-WSA lands would result in surface disturbance to soils and vegetation that would alter the landscape and diminish the natural character of these non-WSA lands. Further, the presence and noise of motorized vehicles would degrade a visitor's opportunity for solitude and conflict with opportunities for primitive and unconfined recreation activities.

Under this alternative, 120,964 acres within non-WSA lands with wilderness characteristics would be limited to OHV use. In these areas, 294.8 miles of routes would be designated in the following non-WSA lands:

Arches Adjacent – 0.52 miles
Beaver Creek – 18.75 miles
Behind the Rocks – 7.17 miles
Big Triangle – 0.64 miles
Coal Canyon – 7.26 miles
Desolation Canyon – 2.9 miles
Dome Plateau – 2.11 miles
Fisher Towers – 10.98 miles
Floy Canyon – 18.19 miles
Flume Canyon – 4.5 miles
Goldbar – 13.64 miles
Gooseneck – 0.66 miles
Granite Creek – 0.35 miles
Hatch Wash – 35.59 miles
Hideout Canyon – 2.99 miles
Horsethief Point – 1.27 miles
Hunter Canyon – 4.09 miles
Labyrinth Canyon – 60.26 miles
Lost Spring Canyon – 48.44 miles
Mary Jane Canyon – 33.32 miles
Mexico Point – 0.19 miles
Mill Creek Canyon – 7.99 miles
Negro Bill Canyon – 5.67 miles
Westwater Canyon – 3.83 miles
Westwater Creek – 3.37 miles
Yellow Bird – 0.27 miles

Limiting OHV use would confine soil and vegetation disturbance caused by motor vehicles to existing routes, and result in no additional change to the natural character of the non-WSA lands. The presence and noise of vehicles using these routes, however, would reduce the opportunity of visitors to find solitude in the non-WSA areas, especially in proximity to the routes. Motorized uses would conflict with primitive and unconfined recreation opportunities sought in the non-WSA areas.

Currently, there are no routes within Dead Horse Cliffs, Harts Point, Hatch/Lockhart, or Shafer Canyon, non-WSA lands with wilderness characteristics. Because no routes would be designated in these areas, surface disturbance caused by motorized travel, and the resultant impacts to the natural character of the non-WSA areas, would not be evidenced. Further, because there would be no OHV use in these areas, the opportunities for solitude or conflict with primitive forms of recreation in these areas could not be reduced. The natural character and opportunities for solitude and primitive recreation of these non-WSA areas would be unaffected by OHV travel.

While Hells Hole and Spruce Canyon non-WSA lands currently have no routes within them, they remain open to cross country OHV travel and impacts to wilderness characteristics could occur if OHV users choose to engage in cross country use.

Common to Alternatives B, C, and D

Under all of the action alternatives, vehicles must stay on designated routes. Game retrieval and antler collection must be done on foot and vehicles cannot go off designated roads for such activities. The MFO would not authorize cross-country travel for any commercial or organized group events. All motorized routes that would not be designated as open would be signed as closed. These actions would continue to preserve the natural character of the non-WSA lands with wilderness characteristics because no new surface disturbing activity would be allowed from motorized vehicles.

Alternative B

Under this alternative, all non-WSA lands with wilderness characteristics would be limited to designated routes. In these areas, 117.3 miles of routes would be designated in the following non-WSA lands:

Beaver Creek – 5.69 miles
Behind the Rocks – 2.33 miles
Coal Canyon – 2.02 miles
Desolation Canyon – 2.69 miles
Fisher Towers – 4.3 miles
Flume Canyon – 0.64 miles
Goldbar – 5.39 miles
Gooseneck – 0.66 miles
Granite Creek – 0.13 miles
Hatch Wash – 34.57 miles
Hideout Canyon – 2.58 miles
Hunter Canyon – 2.29 miles
Labyrinth Canyon – 31.38 miles
Lost Spring Canyon – 6.51 miles
Mary Jane Canyon – 7.15 miles
Mill Creek Canyon – 4.1 miles
Negro Bill Canyon – 1.65 miles
Westwater Canyon – 2.91 miles
Westwater Creek – 0.32 miles

Limiting OHV use to existing routes would confine soil and vegetation disturbance caused by motor vehicles to existing routes, and result in no additional change to the natural character of the non-WSA lands. The presence and noise of vehicles using these routes, however, would reduce the opportunity of visitors to find solitude in the non-WSA areas, especially in proximity to the routes. And, motorized uses would conflict with primitive and unconfined recreation

opportunities sought in the non-WSA areas. The most notable areas where there would be a significant decrease in miles of routes would be in Labyrinth Canyon, Lost Spring Canyon, and Mary Jane Canyon. In addition, six areas that would have designated routes in Alternative A would have none in Alternative B.

There would be no routes designated in Arches Adjacent, Big Triangle, Dead Horse Cliffs, Dome Plateau, Floy Canyon, Harts Point, Hatch/Lockhart, Hells Hole, Horsethief Point, Mexico Point, Shafer Canyon, Spruce Canyon, or Yellow Bird non-WSA lands with wilderness characteristics. Because no routes would be designated in these areas, surface disturbance caused by motorized travel, and the resultant impacts to the natural character of the non-WSA areas, would not be evidenced. Further, because there would be no OHV use in these areas, the opportunities for solitude or conflict with primitive forms of recreation in these areas could not be reduced. The natural character and opportunities for solitude and primitive recreation of these non-WSA areas would be unaffected by OHV travel.

Alternative C

Under this alternative, and as in Alternative B, all non-WSA lands with wilderness characteristics would be limited to designated routes. In these areas, 158.54 miles of routes would be designated in the following non-WSA lands:

Beaver Creek – 12.45 miles
Behind the Rocks – 5.18 miles
Coal Canyon – 3.04 miles
Desolation Canyon – 2.9 miles
Fisher Towers – 4.3 miles
Floy Canyon – 3.7 miles
Flume Canyon – 0.64 miles
Goldbar – 9.54 miles
Gooseneck – 0.66 miles
Granite Creek – 0.13 miles
Hatch Wash – 34.91 miles
Hideout Canyon – 2.58 miles
Hunter Canyon – 3.7 miles
Labyrinth Canyon – 39.18 miles
Lost Spring Canyon – 12.99 miles
Mary Jane Canyon – 10.04 miles
Mill Creek Canyon – 5.7 miles
Negro Bill Canyon – 1.9 miles
Westwater Canyon – 2.91 miles
Westwater Creek – 2.0 miles

Limiting OHV use to existing routes would confine soil and vegetation disturbance caused by motor vehicles to existing routes, and result in no additional change to the natural character of the non-WSA lands. The presence and noise of vehicles using these routes, however, would reduce the opportunity of visitors to find solitude in the non-WSA areas, especially in proximity to the routes. And, motorized uses would conflict with primitive and unconfined recreation opportunities sought in the non-WSA areas. The most notable areas where there would be a significant decrease in miles of routes would be in Labyrinth Canyon, Lost Spring Canyon, and Mary Jane Canyon. In addition, five areas that would have designated routes in Alternative A would have none in Alternative C.

There would be no routes designated in Arches Adjacent, Big Triangle, Dead Horse Cliffs, Dome Plateau, Harts Point, Hatch/Lockhart, Hells Hole, Horsethief Point, Mexico Point, Shafer Canyon, Spruce Canyon, or Yellow Bird non-WSA lands with wilderness characteristics. Because no routes would be designated in these areas, surface disturbance caused by motorized travel, and the resultant impacts to the natural character of the non-WSA areas, would not be evidenced. Further, because there would be no OHV use in these areas, the opportunities for solitude or conflict with primitive forms of recreation in these areas could not be reduced. The natural character and opportunities for solitude and primitive recreation of these non-WSA areas would be unaffected by OHV travel.

Alternative D

Under this alternative, and as in Alternatives B and C, all non-WSA lands with wilderness characteristics would be limited to designated routes. In these areas, 169 miles of routes would be designated in the following non-WSA lands:

Beaver Creek – 12.45 miles
Behind the Rocks – 6.79 miles
Coal Canyon – 3.42 miles
Desolation Canyon – 2.9 miles
Fisher Towers – 4.3 miles
Floy Canyon – 3.7 miles
Flume Canyon – 0.64 miles
Goldbar – 9.54 miles
Gooseneck – 0.66 miles
Granite Creek – 0.13 miles
Hatch Wash – 35.39 miles
Hideout Canyon – 2.58 miles
Hunter Canyon – 3.96 miles
Labyrinth Canyon – 40.84 miles
Lost Spring Canyon – 14.09 miles
Mary Jane Canyon – 11.81 miles
Mill Creek Canyon – 7.57 miles
Negro Bill Canyon – 2.55 miles
Westwater Canyon – 3.71 miles
Westwater Creek – 2.0 miles

Limiting OHV use to existing routes would confine soil and vegetation disturbance caused by motor vehicles to existing routes, and result in no additional change to the natural character of the non-WSA lands. The presence and noise of vehicles using these routes, however, would reduce the opportunity of visitors to find solitude in the non-WSA areas, especially in proximity to the routes. And, motorized uses would conflict with primitive and unconfined recreation opportunities sought in the non-WSA areas. The most notable areas where there would be a significant decrease in miles of routes would be in Labyrinth Canyon, Lost Spring Canyon, and Mary Jane Canyon. In addition, five areas that would have designated routes in Alternative A would have none in Alternative D.

There would be no routes designated in Arches Adjacent, Big Triangle, Dead Horse Cliffs, Dome Plateau, Harts Point, Hatch/Lockhart, Hells Hole, Horsethief Point, Mexico Point, Shafer Canyon, Spruce Canyon, or Yellow Bird non-WSA lands with wilderness characteristics. Because no routes would be designated in these areas, surface disturbance caused by motorized travel, and the resultant impacts to the natural character of the non-WSA areas, would not be evidenced. Further, because there would be no OHV use in these areas, the opportunities for

solitude or conflict with primitive forms of recreation in these areas could not be reduced. The natural character and opportunities for solitude and primitive recreation of these non-WSA areas would be unaffected by OHV travel.

In summary, Alternative A would continue to allow cross country travel in some of the non-WSA lands with wilderness characteristics and also would designate the most miles of routes within the non-WSA areas. Alternative A would manage 6 areas without designated routes. Alternative B would limit travel to designated routes and reduce the number of miles of routes in these areas by 178 miles, or over 60%, from Alternative A. In addition, Alternative B would manage 13 non WSA areas without designated routes within them. Alternative C would limit travel to 158.5 miles designated routes, adding 41.2 miles of routes over Alternative B into a mix of the non-WSA lands with wilderness characteristics. Alternative C would manage 12 non-WSA areas without any designated routes within them. And finally, Alternative D would limit travel to 169 miles of routes, adding nearly 52 miles of routes into the mix from Alternative B. The same areas that had no designated routes in Alternative C would hold for Alternative D. The highest level of protection of wilderness characteristics values from OHV impacts would be under Alternative B, then C, then D, and last of all Alternative A.

4.3.8.2.13.2 Mechanized Recreational Travel (Mountain Bikes)

Alternative A

Areas currently open to motorized cross-country travel would continue to be open for cross-country mountain bike use. In non-WSA lands with wilderness characteristics, this would be the same as described under Alternative A under the OHV Travel Management section above. Any new development of trails for mountain bikes in non-WSA areas would be in conflict with the primitive forms of trail use. If there were substantial levels of use on the trails (by foot, horse, and/or bike) in the non-WSA lands, the visitor's ability to find and experience solitude would be reduced. Construction of new trails would create surface disturbance that would detract from the natural character of the landscape and non-WSA lands, depending on the type of landform and vegetation cover. The change to the natural landscape, however, is expected to be minimal.

Common to Alternatives B, C, and D

Under the action alternatives, mountain bikes would only be allowed on routes open for motorized use for resource protection purposes. Some routes would only be designated for non-motorized use only. Two of these non-motorized routes identified specifically for mountain bike use would be the "Baby-Steps" trail in Arches Adjacent non-WSA area and the Hunter Canyon Rim trail in the Behind the Rocks non-WSA land with wilderness characteristics. If there were substantial levels of use on the trails (by foot, horse, and/or bike) in the non-WSA lands, the visitor's ability to find and experience solitude would be reduced. The change to the natural landscape, however, is expected to be minimal.

Under all of the alternatives are varying miles of projected mountain-bike routes that would be designated. Because they would generally be on already existing inventoried routes that would not be designated for motorized use, impacts to naturalness would be negligible on the non-WSA lands with wilderness characteristics. Where mountain bike trails are designated within non-

WSA areas, however, substantial levels of use on the trails (by foot, horse, and/or bike), would reduce the visitor's ability to find and experience solitude and primitive recreation.

4.3.8.2.13.3 Non-Mechanized Recreational Travel (Hiking, Backpacking and Equestrian)

Alternative A

Although numerous trails exist in non-WSA lands with wilderness characteristics, there would be no specific plans to design, implement, sign, or manage a non-mechanized trail system. Because these forms of recreation are complementary to the wilderness characteristic values of non-WSA lands, and can help focus the primitive recreational user, some opportunities to improve the recreational experience may be foregone.

Alternatives B, C, and D

Under all of the action alternatives, the Amphitheater Loop and Fisher Towers Trails, both in the Fisher Towers non-WSA lands with wilderness characteristics, and the Corona Arch Trail in the Goldbar non-WSA area would be managed for non-mechanized travel. In addition, there are varying miles of existing trails that would be specifically managed for hiking and other non-mechanized recreation opportunities under each of the action alternatives. All of them would convert existing inventoried routes to non-mechanized travel. Impacts to naturalness would be negligible on the non-WSA lands with wilderness characteristics. Managing additional trails for hiking and horseback riding would provide further opportunities for primitive forms of recreation where the trails would be located in any of the non-WSA lands with wilderness characteristics. Under all three action alternatives, the Castleton trail in Mary Jane Canyon non-WSA area, and the Culvert-Goldbar loop trail in Goldbar non-WSA area would be marked and managed for hiking, and a new hiking trail would be signed and managed from Onion Creek to the Amphitheater Loop in the Fisher Towers non-WSA area. Any additional managed trails would be specified at the activity-level stage of planning following completion of the RMP.

4.3.8.2.14 Impacts of Vegetation Decisions on Non-WSA Lands with Wilderness Characteristics

Under all alternatives, control of noxious weeds would have both positive and negative impacts on the wilderness characteristics of non-WSA lands, depending on the method of control. The use of fire, chemical, and biological treatments would control noxious weeds and insects with no apparent evidence of human intervention on the landscape. Thus there would be no noticeable effect on the natural character of the non-WSA lands with wilderness characteristics, if those treatments were necessary in the non-WSA areas that have wilderness characteristics. Control of non-native vegetation, and restoration of native vegetation communities, however, would result in a more natural vegetation community and thus, natural condition of the non-WSA areas. The use of mechanical treatments to eradicate non-native vegetation and would leave a noticeable imprint of human work on the landscape, and degrade the natural character of non-WSA lands, if the treatments were to occur in the non-WSA areas. Depending on the vegetation community treated (grassland and shrubland versus a woodland or coniferous forest), the length of time the

evidence of mechanical treatments remained on the landscape would vary before the surface and vegetation disturbances returned to a more natural or unmodified condition.

Reclaiming or restoration of up to 257,809 acres of sagebrush-steppe habitat would have the same impact on the natural character of the non-WSA lands as described above. Depending on the treatment method used, the effects on naturalness would be of little effect and beneficial to the natural condition of the non-WSA lands or an apparent evidence of human intervention on the land, and longer-lasting.

4.3.8.2.15 Impacts of Visual Resource Management Decisions on Non-WSA Lands with Wilderness Characteristics

There are four objectives for visual resources management (VRM Classes I through IV) that provide for various levels of landscape protection and change. The objective of Class I is to preserve the characteristic landscape, while the objective of Class IV provides for landscape modifications (see Section 3.19, Visual Resources). The only lands identified under all alternatives to be designated VRM Class I are lands within WSAs. VRM Class II objectives would retain the characteristic landscape, allowing for minor changes to the landform and vegetation. This objective would protect the natural condition of the land in non-WSA areas. The objective of VRM Class III is to partially retain the existing character of the landscape, allowing for moderate changes to land and vegetation. This objective is not compatible with preserving the natural character of non-WSA lands. Class IV objectives provide for major modification of the landscape and are clearly incompatible with preservation of the natural character of non-WSA lands.

Table 4.55 shows the VRM designation (Classes I through IV) within non-WSA lands with wilderness characteristics, by alternative.

Table 4.55. VRM Designation in Non-WSA Lands with Wilderness Characteristics (acres)

Name of non-WSA Area	Total Acres	VRM Class	Alternative			
			A[2]	B	C	D
Arches Adjacent	6396	II	0	6396	6396	6396
Beaver Creek	25722	I	0	5477	0	0
		II	0	20245	25538	15924
		III	0	0	184	9798
Behind the Rocks	3643	I	0	1460	0	0
		II	0	2183	2007	0
		III	0	0	1636	3643
Big Triangle	5200	II	0	5200	0	0
		III	0	0	5200	5200

[2] VRM was not a management decision in the 1985 RMP (reflected in Alternative A), except for a plan amendment affecting only the Canyon Rims Recreation Area

Table 4.55. VRM Designation in Non-WSA Lands with Wilderness Characteristics (acres)

Name of non-WSA Area	Total Acres	VRM Class	Alternative			
			A[2]	B	C	D
Coal Canyon	21632	II	0	21632	0	0
		III	0	0	7516	7062
		IV	0	0	14116	14570
Dead Horse Cliffs	797	I	0	35	0	0
		II	0	762	797	797
Desolation Canyon	10498	II	0	10498	9076	9092
		III	0	0	1422	1406
Dome Plateau	14207	I	0	9598	0	0
		II	0	4609	11840	11669
		III	0	0	2367	2538
Fisher Towers	17235	I	0	6466	0	0
		II	0	10769	12449	12423
		III	0	0	4786	4812
Floy Canyon	9983	II	0	9983	786	786
		III	0	0	9158	9158
		IV	0	0	39	39
Flume Canyon	3520	II	0	3520	0	0
		III	0	0	1471	1418
		IV	0	0	2049	2102
Goldbar	6437	I	0	821	0	0
		II	0	5616	6437	0
		III	0	0	0	6437
Gooseneck	843	I	0	843	0	0
		II	0	0	843	0
		III	0	0	0	843
Granite Creek	4528	II	0	4528	3150	3150
		III	0	0	1378	1378
Harts Point (MFO)	1465	II	1425	1465	1425	1425
		III	40	0	40	40
Hatch Wash	10983	II	4466	10983	9726	8981
		III	6517	0	1310	2055
Hatch/Lockhart	2670	II	0	2670	2088	2088
		III	0	0	582	582
Hells Hole	2538	II	0	2538	0	180
		III	0	0	2538	2358

Table 4.55. VRM Designation in Non-WSA Lands with Wilderness Characteristics (acres)

Name of non-WSA Area	Total Acres	VRM Class	Alternative			
			A[2]	B	C	D
Hideout Canyon	11,607	II	0	11607	0	0
		III	0	0	11607	11607
Horsethief Point	8,358	I	0	739	0	0
		II	0	7619	6026	1171
		III	0	0	2332	7187
Hunter Canyon	4,465	I	0	2771	0	0
		II	0	1694	4465	0
		III	0	0	0	4465
Labyrinth Canyon	25,361	I	0	5668	0	0
		II	0	19693	11991	8954
		III	0	0	13370	16407
Lost Spring Canyon	11,456	II	0	11456	7095	7095
		III	0	0	4361	4361
Mary Jane Canyon	24,779	I	0	17854	0	0
		II	0	6925	24779	24779
Mexico Point	12837	II	0	12837	3	3
		III	0	0	12834	12834
Mill Creek Canyon	3388	I	0	2344	0	0
		II	0	1044	3388	3388
Negro Bill Canyon	2333	I	0	170	0	0
		II	0	2163	2333	2333
Shafer Canyon	1842	II	0	1842	1842	0
		III	0	0	0	1842
Spruce Canyon	1131	II	0	1131	161	0
		III	0	0	970	1131
Westwater Canyon	3086	I	0	83	0	0
		II	0	3003	1215	1215
		III	0	0	1871	1871
Westwater Creek	7188	II	0	7188	0	0
		III	0	0	7188	7188
Yellow Bird	357	II	0	357	357	357

4.3.8.2.15.1 Alternative A

There were no VRM class objectives defined in the 1985 Grand RMP reflected in Alternative A, except for a plan amendment affecting only the Canyon Rims Recreation Area which incorporates Harts Point and Hatch Wash non-WSA lands with wilderness characteristics. Under this alternative, 5,892 acres in these two areas would be managed by VRM Class II objectives, protecting the natural character of those lands in the non-WSA areas. An additional 6,556 acres would be managed by VRM Class III objectives in these two areas. Because moderate changes could be allowed to the land and vegetation, this objective would not be compatible with preserving the natural character of non-WSA lands and could put these values at risk.

4.3.8.2.15.2 Alternative B

Under Alternative B, all 266,485 acres would be managed by VRM Class II objectives in the 32 non-WSA lands with wilderness characteristics. Retaining the natural character of these areas by precluding surface disturbing activities would protect the natural character of those lands in the non-WSA areas.

4.3.8.2.15.3 Alternative C

Under Alternative C, 156,210 acres would be managed by VRM Class II objectives in all or parts of 25 non-WSA lands with wilderness characteristics, protecting the natural character of those lands in the non-WSA areas. Ten of the 24 areas (Arches Adjacent, Dead Horse Cliffs, Goldbar, Gooseneck, Hunter Canyon, Mary Jane Canyon, Mill Creek Canyon, Negro Bill Canyon, Shafer Canyon, and Yellow Bird) would be wholly under the VRM Class II objectives, fully protecting those areas from visual intrusions and maintaining the natural character of the areas.

The areas not under the VRM II objectives would be managed by VRM III and IV objectives which would be incompatible with protecting wilderness characteristics values because changes to the landscape would be permitted. This would include all of seven non-WSA areas (Big Triangle, Coal Canyon, Flume Canyon, Hells Hole, Hideout Canyon, Mexico Point, and Westwater Creek) and portions of 22 non-WSA lands with wilderness characteristics.

4.3.8.2.15.4 Alternative D

Under Alternative D, 122,203 acres would be managed by VRM Class II objectives in all or parts of 19 non-WSA lands with wilderness characteristics, protecting the natural character of those lands in the non-WSA areas. Six of the 19 areas (Arches Adjacent, Dead Horse Cliffs, Mary Jane Canyon, Mill Creek Canyon, Negro Bill Canyon, and Yellow Bird) would be wholly under the VRM Class II objectives, protecting those areas from visual intrusions and maintaining the natural character of the areas.

The areas not under the VRM II objectives would be managed by VRM III and IV objectives which would be incompatible with protecting wilderness characteristics values because changes to the landscape would be permitted. This would include all of 12 non-WSA areas (Behind the Rocks, Big Triangle, Coal Canyon, Flume Canyon, Goldbar, Gooseneck, Hideout Canyon,

Hunter Canyon, Mexico Point, Shafer Canyon, Spruce Canyon, and Westwater Creek) and portions of 18 non-WSA lands with wilderness characteristics.

In summary, the visual resource management objectives proposed in Alternative B would provide protection of the natural character of all the non-WSA lands with wilderness characteristics. VRM objectives in Alternative C would provide protection to the natural character of the 156,210 acres in all or parts of 25 non-WSA areas, followed by Alternative D with 122,203 acres protected in all or parts of 19 non-WSA areas. Alternative A only has VRM class objectives for two non-WSA area, of which only a portion of each would fall into a VRM II management class. Visual resource objectives in Alternatives A and D provide the least protection to the natural character of the non-WSA lands with wilderness characteristics.

4.3.8.2.16 Impacts of Wildlife and Fisheries Decisions on Non-WSA Lands with Wilderness Characteristics

4.3.8.2.16.1 Management Actions Common to All Alternatives

Under all alternatives, a variety of actions would be implemented to restore, maintain, and enhance native wildlife populations. Improved wildlife populations would enhance the natural character of the land in all of the non-WSA lands with wilderness characteristics. Further, larger and healthier wildlife populations would expand opportunities for primitive and unconfined recreation opportunities, including wildlife viewing, hunting, and natural history study.

A goal of the Dolores Triangle HMP is to manage and benefit wildlife, bird, and fish species through the installation of fencing and enclosures in Granite Creek. This could affect the Granite Creek non-WSA lands with wilderness characteristics. Although a benefit for wildlife, construction of human made features on the land would degrade the natural, undeveloped character of the non-WSA lands with wilderness characteristics. Under Alternative B, this activity would most likely be precluded or mitigated within the wilderness characteristics lands due to the restrictive decisions in place.

Within pronghorn habitat, a common to all alternatives decision is to install and improve year-round water sources within the LaSal Management Unit and the Cisco Desert Herd Unit. This could affect the Hatch Wash and Harts Point non-WSA lands with wilderness characteristics in the LaSal Unit, and the Floy Canyon and Coal Canyon non-WSA lands with wilderness characteristics in the Cisco Desert Herd Unit. Construction of water sources to support wildlife populations would result in more wildlife and the benefits described above. Construction of human made features on the land, however, would degrade the natural, undeveloped character of the non-WSA lands with wilderness characteristics. Under Alternative B, new water developments or facilities would most likely be precluded or mitigated within the wilderness characteristics lands due to the restrictive decisions in place.

In bighorn sheep habitat, a decision to increase bighorn populations would involve installation of new water facilities and new water developments every 5 square miles in or within 2 miles of escape terrain and lambing grounds. This would involve Labyrinth Canyon, Shafer Canyon, Gooseneck, Goldbar, Horsethief Point, Dead Horse Cliffs, and Hatch/Lockhart non-WSA lands

with wilderness characteristics. These lands are small areas within a large habitat, and the animals move in and out of wilderness characteristics lands. Construction of water sources to support wildlife populations would result in more wildlife and the benefits described above. Construction of human made features on the land, however, would degrade the natural, undeveloped character of the non-WSA lands with wilderness characteristics. Under Alternative B, new water developments or facilities would most likely be precluded or mitigated within the wilderness characteristics lands due to the restrictive decisions in place.

Within deer and elk habitat, elk forage would be increased through vegetation treatments such as chemical, mechanical, and prescribed fire on approximately 40,000 acres of elk winter range. This could include areas in the Big Triangle, Westwater Canyon, Hells Hole, Hideout Canyon, Mexico Point, Westwater Creek, Flume Canyon, Coal Canyon, Floy Canyon and Desolation Canyon non-WSA lands with wilderness characteristics. The use of fire and chemical treatments would have no apparent evidence of human intervention on the landscape. Thus there would be no noticeable effect on the natural character of the non-WSA lands with wilderness characteristics, if those treatments were necessary in the non-WSA areas that have wilderness characteristics. Restoration of vegetation communities, however, would result in a more natural vegetation community and thus, natural condition of the non-WSA areas. The use of mechanical treatments for vegetation manipulations would leave a noticeable imprint of human work on the landscape, and degrade the natural character of non-WSA lands, if the treatments were to occur in the non-WSA areas. Depending on the vegetation community treated (grassland and shrub land vs. a woodland or coniferous forest), the length of time the evidence of mechanical treatments remained on the landscape would vary before the surface and vegetation disturbances returned to a more natural or unmodified condition.

4.3.8.2.16.2 Alternative A and D

See Management Common to All.

4.3.8.2.16.3 Alternative B and C

Under these alternatives, a NSO stipulation to protect bighorn sheep lambing, rutting, and migration habitat would be applied. This would involve small portions of Labyrinth Canyon, Shafer Canyon, Gooseneck, Goldbar, Horsethief Canyon, Dead Horse Cliffs, and Hatch/Lockhart non-WSA lands with wilderness characteristics, and protect the natural character of these areas from surface disturbing activities associated with oil and gas development and other surface disturbing activities.

4.3.8.2.17 Impacts of Woodlands Decisions on Non-WSA Lands with Wilderness Characteristics

Under all alternatives, permits for woodland products would continue to be sold to the public, consistent with the availability of woodland products and the protection of sensitive resource values. Each alternative prescribes areas where woodland product harvest is allowed or prohibited. Table 4.56 provides the acres of areas open or closed to woodland harvest by alternative for non-WSA lands with wilderness characteristics.

Table 4.56. Wood-Cutting Restrictions in non-WSA Lands with Wilderness Characteristics

			Alternative			
Name of non-WSA Area	**Total Acres**	**Availability**	**A**	**B**	**C**	**D**
Arches Adjacent	6396	open	5407	*0*	5407	5407
		closed	989	6396	989	989
Beaver Creek	25722	open	25722	0	184	25722
		closed	0	25722	25538	0
Behind the Rocks	3643	open	2807	0	1538	2807
		closed	836	3643	2105	836
Big Triangle	5200	open	5200	0	5200	5200
		closed	0	5200	0	0
Coal Canyon	21632	open	21632	0	21632	21632
		closed	0	21632	0	0
Dead Horse Cliffs	797	open	482	0	482	482
		closed	315	797	315	315
Desolation Canyon	10498	open	10498	0	5182	10498
		closed	0	10498	5316	0
Dome Plateau	14207	open	7989	0	7989	7989
		closed	6218	14207	6218	6218
Fisher Towers	17235	open	9699	0	9559	9699
		closed	7536	17235	7676	7536
Floy Canyon	9983	open	9983	0	9983	9983
		closed	0	9983	0	0
Flume Canyon	3520	open	3520	0	3520	3520
		closed	0	3520	0	0
Goldbar	6437	open	5974	0	5972	5974
		closed	463	6437	465	463
Gooseneck	843	closed	843	843	843	843
Granite Creek	4528	open	4528	0	4528	4528
		closed	0	4528	0	0
Harts Point (MFO)	1465	closed	1465	1465	1465	1465
Hatch/Lockhart	2670	closed	2670	2670	2670	2670
Hatch Wash	10983	closed	10983	10983	10983	10983
Hells Hole	2538	open	2358	0	2358	2358
		closed	0	2538	0	0
Hideout Canyon	11607	open	11607	0	11607	11607
		closed	0	11607	0	0

Table 4.56. Wood-Cutting Restrictions in non-WSA Lands with Wilderness Characteristics

			Alternative			
Name of non-WSA Area	**Total Acres**	**Availability**	**A**	**B**	**C**	**D**
Horsethief Point	8358	open	7860	0	7860	7860
		closed	498	8358	498	498
Hunter Canyon	4465	open	4150	0	1378	4150
		closed	315	4465	3087	315
Labyrinth Canyon	25361	open	19738	0	19530	19738
		closed	5623	25361	5831	5623
Lost Spring Canyon	11456	open	11456	0	11456	11456
		closed	0	11456	0	0
Mary Jane Canyon	24779	open	4618	0	3799	4618
		closed	20161	24779	20980	20161
Mexico Point	12837	open	12837	0	12837	12837
		closed	0	12837	0	0
Mill Creek Canyon	3388	open	2481	0	608	2481
		closed	907	3388	2780	907
Negro Bill Canyon	2333	open	1398	0	1393	1398
		closed	935	2333	940	935
Shafer Canyon	1842	open	40	0	40	40
		closed	1802	1842	1802	1802
Spruce Canyon	1131	open	1131	0	1131	1131
		closed	0	1131	0	0
Westwater Canyon	3086	open	3086	0	3086	3086
		closed	0	3086	0	0
Westwater Creek	7188	open	7188	0	7188	7188
		closed	0	7188	0	0
Yellow Bird	357	open	367	0	357	367
		closed	0	357	0	0

4.3.8.2.17.1 Alternatives A and D

Under both of these alternatives, wood-cutting would be prohibited on 62,563 acres on all or portions of 17 non-WSA lands with wilderness characteristics. Four non-WSA areas would be completely restricted from wood-cutting activities (Gooseneck, Harts Point, Hatch Wash and Hatch/Lockhart), thereby preserving the natural character of the landscape from surface disturbing activities associated with woodcutting. Those portions of the non-WSA lands with wilderness characteristics in the other 13 areas that are restricted from wood-cutting activities

would be provided the same protections. However, in the 203,922 acres that remain open for wood-cutting (and where the resource exists), wilderness characteristics may be compromised by surface disturbing activities such as driving cross-country to the trees, cutting the trunks of trees and leaving stumps and debris, and by affecting the solitude and primitive recreation opportunities with chain saws and surface disturbances associated with human activity.

4.3.8.2.17.2 Alternative B

All 266,485 acres of non-WSA lands with wilderness characteristics in the 32 areas within the MPA would be restricted from wood-cutting activities under this alternative. All wilderness characteristics values would therefore be protected from this activity and maintain the natural character and opportunities for solitude and primitive recreation.

4.3.8.2.17.3 Alternative C

Under this alternative, wood-cutting would be prohibited on 100,501 acres on all or portions of 19 non-WSA lands with wilderness characteristics. Five non-WSA areas would be completed restricted from wood-cutting activities (Beaver Creek, Gooseneck, Harts Point, Harts/Lockhart, and Hatch Wash), thereby preserving the natural character of the landscape from surface disturbing activities associated with woodcutting. Those portions of the non-WSA lands with wilderness characteristics in the other 14 areas that are restricted from wood-cutting activities would be provided the same protections. However, in the 165,984 acres that remain open for wood-cutting (and where the resource exists), wilderness characteristics may be compromised by surface disturbing activities such as driving cross-country to the trees, cutting the trunks of trees and leaving stumps and debris, and by affecting the solitude and primitive recreation opportunities with mechanical chain saws and surface disturbances associated with human activity.

4.3.8.3 SUMMARY

The majority of adverse impacts to naturalness and outstanding opportunities would be caused by surface disturbing activities such as woodland product harvest, land treatments, mineral development, and OHV use.

Woodland product harvest and land treatments would have the potential to denude vegetation and create surface and visual disturbances, thereby degrading naturalness. The noise created by vehicles accompanying these activities would adversely affect the outstanding opportunities for solitude. Harvesting in areas where mechanized vehicular travel is limited to existing/designated routes would concentrate harvest next to access roads. Due to the low level of woodland harvest in the MPA, however, and the fact that opportunities for solitude and primitive recreation are already impaired next to roads, the impacts to wilderness characteristics from this activity would be minimal. As vegetation reestablishes, this effect would be less noticeable, although it could take decades before the treated area would be indistinguishable from its surroundings. In areas closed to woodland product harvest and firewood gathering, wilderness characteristics would be protected.

In areas open to oil and gas leasing the presence and noise of people, vehicles, and equipment needed for exploration and production of energy resources would impact opportunities for solitude and primitive recreation in proximity to wells. Depending upon the terrain, vegetation, atmospheric conditions, etc., outstanding opportunities for solitude and primitive recreation could be lost in a substantial portion or the whole of these areas during the period of exploration and development. In areas that are managed as NSO or closed to oil and gas leasing, wilderness characteristics would be maintained.

Wilderness characteristics would be adversely impacted by cross-country OHV use because of surface disturbance and noise. In the areas where OHV use is limited to designated routes there would be temporary impacts from noise. The noise and exhaust from vehicles may disperse some species of wildlife and may adversely impact recreationists seeking solitude. In areas that are closed to OHV use, wilderness characteristics would be protected.

Realty actions such as road, power line or pipeline ROWs would be allowed in areas open to surface disturbing activities. Generally, areas open to oil and gas leasing with standard lease terms and special stipulations are open to other surface disturbing activities. Many realty actions would affect the natural character of the area within the viewshed of the development. Some developments, such as roads, would also affect opportunities for solitude and primitive recreation. Managing lands as exclusion areas for ROWs would protect wilderness characteristics from adverse impacts. Managing lands as an avoidance area for ROWs may protect wilderness characteristics but this would not be guaranteed.

Managing lands as VRM Classes III and IV would have adverse impacts on wilderness characteristics because these classes allow for moderate to major changes in the landscape thereby allowing large visual disturbances. Managing lands as VRM Class I would beneficially impact wilderness characteristics because this class precludes surface disturbance. VRM Class II management would keep the level of change to the landscape low but should not attract the attention of the casual observer. This would protect the natural character on a landscape level but there would risks of small localized impacts being visible.

Tables 4.57–4.60 summarize how the 266,485 acres of land having wilderness characteristics would be managed by alternative, whether or not they are being managed to protect wilderness characteristics. In Alternative B, the entire 266,485 acres would be managed specifically to protect wilderness characteristics. In Alternative C, 47,761 acres would be managed specifically to protect wilderness characteristics. The remaining acres in Alternative C, as well as the total acreage in Alternatives A and D are not managed specifically to protect wilderness characteristics.

The management of the entire 266,485 acres is shown by alternative for oil and gas leasing, VRM management, OHV use, and availability for woodland product harvest. Restrictions are a result of various management decisions, depending upon alternative. A discussion of impacts by alternative follows these tables.

Table 4.57. Summary of Oil and Gas Leasing Involving Non-WSA Lands with Wilderness Characteristics

		Alternative A	Alternative B	Alternative C	Alternative D
Open to Leasing					
Standard Lease Terms	Acres	157,471	0	36,644	74,194
	%	59.0	0	14.0	28.0
Controlled Surface Use/ Timing Limitations	Acres	93,382	0	124,537	157,939
	%	35.0	0	47.0	59.0
No Surface Occupancy	Acres	13,033	0	87,512	34,352
	%	5.0	0	33.0	13.0
Closed to Leasing					
Closed	Acres	2,598	266,485	17,792	0
	%	1.0	100	6.0	0
Total		**266,485**	**266,485**	**266,485**	**266,485**

Table 4.58. Summary of VRM Classes Involving Non-WSA Lands with Wilderness Characteristics

		Alternative A	Alternative B	Alternative C	Alternative D
Class I	Acres	130	0	2,689	0
	% "with WC" lands	1%	0%	1.0%	0%
Class II	Acres	168,983	266485	147,799	115,995
	% "with WC" lands	63%	100%	55%	43%
Classes III & IV	Acres	97,462	0	115,997	150,490
	% "with WC" lands	36%	0%	44%	57%
Total		**266,485**	**266,485**	**266,485**	**266,485**

Table 4.59. Summary of OHV Area Designations Involving Non-WSA Lands with Wilderness Characteristics

		Alternative A	Alternative B	Alternative C	Alternative D
Open to cross-country OHV use	Acres	136,816	0	0	0
	% "with WC" lands	58%	0%	0%	0%
Limited to existing/ designated routes	Acres	96,929	266,485	266,485	266,485
	% "with WC" lands	42%	100%	100%	100%
Closed to OHVs	Acres	0	0	0	0
	% "with WC" lands	0%	0%	0%	0%
Total		**266,485**	**266,485**	**266,485**	**266,485**

Table 4.60. Acres of Woodland Harvest Designations Involving Non-WSA Lands with Wilderness Characteristics

		Alternative A	Alternative B	Alternative C	Alternative D
Open to Woodland Harvest	Acres	196,618	0	161,327	203,805
	% "with WC" lands	74%	0%	61%	76%
Closed to Woodland Harvest	Acres	69,867	266,485	105,158	62,680
	% "with WC" lands	26%	100%	39%	24%
Total		**266,485**	**266,485**	**266,485**	**266,485**

4.3.8.3.1 ALTERNATIVE A

Under Alternative A, no acreage would be managed to protect lands with wilderness characteristics. Alternative A provides the least emphasis on management of naturalness and opportunities for solitude and primitive recreation by:

- Having the most lands available for rights-of-way permits (249,363 acres in all or portions of 30 non-WSA areas)
- Allowing for land disposal of some non-WSA lands
- Providing the least restrictions for oil and gas leasing and development
- Leaving the most amount of land available for salable mineral disposal
- Focusing no areas within SRMAs for primitive recreation opportunities
- Allowing for cross-county OHV travel in some areas. Within acreage limited for travel, 294.8 miles of routes would be designated
- Managing no acres for ACECs
- Taking wild and scenic river studies only through eligibility findings
- Having no VRM inventory management direction (with few exceptions due to a land use plan amendment)
- Closing only 62,563 acres of non-WSA lands to commercial and personal-use wood cutting (all or portions of 17 areas);

About 250,853 acres (94%) of the 266,485 acres of lands with wilderness characteristics would be open to mineral leasing with standard lease terms or with controlled surface use/timing limitation stipulations and would be subject to impacts from oil and gas development and other surface disturbing activities. These adverse impacts would compromise the naturalness of non-WSA areas with wilderness characteristics. The wilderness characteristics within the Bookcliffs and Greater Cisco RFDs would be subject to greater potential impacts due to higher predicted number of wells to be developed over the life of the plan. See the minerals section (4.3.7) for more details on the number of wells and surface disturbance predicted for these RFDs.

Approximately 36% of the lands with wilderness characteristics would be managed under VRM Classes III and IV. This would allow major surface disturbing activities to occur and would

potentially degrade the wilderness characteristics of the entire area. In addition 53% is open to cross-country OHV use and 74% is open to woodland harvest. Due to the high percentage of lands open to these surface disturbing activities, wilderness characteristics would potentially be lost in the entire area over the life of the plan.

4.3.8.3.2 ALTERNATIVE B

Under Alternative B, 100% of the non-WSA lands with wilderness characteristics would be managed specifically to protect these characteristics. Alternative B focuses on protection to the natural values and opportunities for solitude and primitive recreation of the non-WSA lands with wilderness characteristics (266,485 acres) by:

- Making all non-WSA lands rights-of-way exclusion areas
- Retaining all non-WSA lands in public ownership to facilitate management of wilderness characteristics
- Closing all non-WSA lands to oil and gas leasing and development
- Closing all non-WSA lands to salable mineral disposal
- Focusing some SRMAs for primitive recreation opportunities
- Designating 117 miles of routes in non-WSA lands to OHV use (limited OHV category)
- Managing 9 ACECs overlying non-WSA lands to protect their relevant and important values
- Managing 43.66 miles of eligible wild and scenic river segments within 7 non-WSA areas as suitable to protect their outstandingly remarkable values
- Managing all non-WSA lands as VRM Class II to retain the characteristic landscape
- Closing the non-WSA lands to commercial and personal-use wood cutting
- Closing the non-WSA lands to road construction
- No surface disturbance allowed (see Appendix C for a description of surface disturbing activities)

These prescriptions would have beneficial impacts by protecting naturalness and opportunities for solitude and primitive recreation from surface disturbing activities and noise and enhancing the continuity of wilderness characteristic lands. Therefore the entire inventory (266,485 acres) of lands having wilderness characteristics would be preserved under this alternative. This management is far more protective of these areas than the management of these areas under Alternative A.

4.3.8.3.3 ALTERNATIVE C

Alternative C provides for some management of natural landscapes and opportunities for solitude and primitive forms of recreation by:

- Making 160,599 acres of non-WSA lands (all or portions of 28 non-WSA areas) rights-of-way avoidance or exclusion areas
- Retaining all non-WSA lands in public ownership

- Applying a NSO stipulation or closure to oil and gas leasing and development on 105,304 acres of non-WSA lands (all or portions of 21 areas)
- Closing 105,304 acres of non-WSA (all or portions of 21 areas) lands to salable mineral disposal
- Focusing some SRMAs for primitive recreation opportunities
- Designating 158.54 miles of routes in non-WSA lands to OHV use (limited OHV category)
- Managing 5 ACECs overlying non-WSA lands to protect their relevant and important values
- Managing 16 miles of eligible wild and scenic river segments within 3 non-WSA areas as suitable to protect their outstandingly remarkable values
- Managing 156,210 acres of non-WSA lands as VRM Class II (all or portions of 25 areas) to retain the characteristic landscape
- Closing 105,501 acres of non-WSA lands to commercial and personal-use wood cutting (all or portions of 19 areas)

Under Alternative C, 47,761 acres of the 266,485 acres of non-WSA lands with wilderness characteristics would be managed to maintain these characteristics. These 47,761 acres would be managed with the same prescriptions as Alternative B except that they would be managed as avoidance areas for ROWs (instead of as exclusion areas) and they would be managed as NSO for oil and gas leasing as well as precluding other surface disturbing activities. As with Alternative B, these prescriptions would protect the wilderness characteristics for these 47,761 acres (unless they cannot be avoided for ROWs). If ROWs were developed, wilderness characteristics could be lost on portions of the 47,761 acres.

About 218,724 acres of lands that have wilderness characteristics would not be managed specifically to protect naturalness and outstanding opportunities. About 161,181 acres (61% of the acreage not managed to protect wilderness characteristics) would be open to mineral leasing with standard lease terms or controlled surface use/timing limitation stipulations, and would be subject to impacts from oil and gas development and other surface disturbing activities. These adverse impacts would compromise the naturalness of areas with wilderness characteristics. The wilderness characteristics within the Bookcliffs and Greater Cisco RFDs would be subject to greater potential impacts due to higher predicted number of wells to be developed over the life of the plan. Please see the minerals section (4.3.7) for more details.

While no acreage would be open to cross country OHV use, approximately 53% of these 218,724 acres would be managed under VRM Classes III and IV, and 61% would be open to woodlands harvest. These actions would allow major surface disturbing activities to occur and would potentially degrade the naturalness of those lands not managed specifically to protect wilderness characteristics.

4.3.8.3.4 ALTERNATIVE D

Alternative D provides for a lesser amount (than alternative B or C) of management of natural landscapes and opportunities for solitude and primitive forms of recreation by:

- Making 242,030 acres of non-WSA lands (all or portions of 32 areas) rights-of-way avoidance or exclusion areas
- Retaining all non-WSA lands in public ownership
- Applying a NSO stipulation to oil and gas leasing and development on 34,352 acres of non-WSA lands (all or portions of 14 areas)
- Closing 34,352 acres of non-WSA (all or portions of 14 areas) lands to salable mineral disposal
- Focusing some SRMAs for primitive recreation opportunities
- Designating 169 miles of routes in non-WSA lands to OHV use (limited OHV category)
- Managing no ACECs overlying non-WSA lands to protect their relevant and important values
- Managing no miles of eligible wild and scenic river segments as suitable to protect their outstandingly remarkable values
- Managing 122,203 acres of non-WSA lands as VRM Class II (all or portions of 19 areas) to retain the characteristic landscape
- Closing 62,563 acres of non-WSA lands to commercial and personal-use wood cutting (all or portions of 17 areas)

Under Alternative D, no acreage would be managed to protect lands with wilderness characteristics. About 232,133 acres of lands with wilderness characteristics (87%) would be open to mineral leasing with standard lease terms or with controlled surface use/timing limitation stipulations and would be subject to impacts from oil and gas development and other surface disturbing activities. These adverse impacts would compromise the naturalness of non-WSA areas with wilderness characteristics. The wilderness characteristics within the Bookcliffs and Greater Cisco RFDs would be subject to greater potential impacts due to higher predicted number of wells to be developed over the life of the plan. See the minerals section (4.3.7) for more details on the number of wells and surface disturbance predicted for these RFDs.

Approximately 54% of the 266,485 acres having wilderness characteristics would be managed under VRM Classes III and IV. This would allow major surface disturbing activities to occur and would potentially degrade the wilderness characteristics of the entire area. While no acreage would be open to cross country OHV use, 76% would be open to woodlands harvest. These actions would allow major surface disturbing activities to occur and would potentially degrade the naturalness of those lands not managed specifically to protect wilderness characteristics. Due to the high percentage of lands open to these surface disturbing activities, naturalness would potentially be lost in most of the non-WSA areas with wilderness characteristic over the life of the plan.

4.3.9 PALEONTOLOGICAL RESOURCES

This section discusses impacts to paleontological resources from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning paleontological resources are described in Chapter 3.

The BLM Regional Paleontologist for the State of Utah has classified all of the geologic units within the MPA according to the Potential Fossil Yield Classification System (PFYC). The BLM is currently using this study in lieu of the current paleontological resource management classification system in the process of considering the use of the PFYC as policy. The PFYC system is described in Section 3.9.4.2, and the results of the PFYC classification for the MPA form the basis for this impacts analysis.

4.3.9.1 Paleontological Resource Assessment

For this analysis, the 73 mapped geologic units which occur within the MPA were classified according to the PFYC, and the results are listed in Table 4.61. Nine units are Class 1, twenty-two are Class 2, twenty-seven are Class 3, thirteen are Class 4/5, and two are Class 5. Surficial exposures of Class 1 units comprise approximately 34,505 acres, Class 2 units approximately 615,034 acres, Class 3 units approximately 722,457 acres, Class 4/5 approximately 378,366 acres, and Class 5 approximately 67,114 acres.

Table 4.61. Mapped Geologic Units Within the MPA and their PFYC Classes in Approximate Descending Stratigraphic Order

Age	Mapped Geologic Unit(S)	PFYC Class
Quaternary (Holocene)	Alluvial fan deposits, undifferentiated alluvial gravel, stream alluvium, bouldery colluvium, landslide deposits, slumps and slides, talus and colluvium, tufa deposits, alluvial mud, eolian deposits	2
Quaternary (Pleistocene)	Basin fill alluvium, alluvial fan deposits, undifferentiated alluvial gravel, stream alluvium, pediment-mantle deposits, terrace gravel, bouldery colluvium, landslide deposits, slumps and slides, talus and colluvium, tufa deposits, alluvial mud, eolian deposits	2
Quaternary or Tertiary	Collapse Breccia	2
Tertiary	Geyser Creek Fanglomerate	2
Tertiary	Green River Formation - Douglas Creek Member, Tongue a and Tongue c	3
Tertiary	Green River Formation - Parachute Creek Member, Upper and lower parts	3
Tertiary	Wasatch Formation	4/5
Tertiary	Wasatch Formation - Renegade Tongue	3
Tertiary	Wasatch Formation-Renegade Tongue, unit w and unit x	3
Tertiary	Green River Formation-Flagstaff Member and North Horn Formation	4/5
Cretaceous	Mancos Shale	3
Cretaceous	Mancos Shale-Buck Tongue	3
Cretaceous	Mancos Shale - Bluegate Member	3
Cretaceous	Mancos Shale-Ferron Sandstone Member	3
Cretaceous	Mancos Shale-Lower Shale Member	3
Cretaceous	Mancos Shale - Sandstone Beds	3

Table 4.61. Mapped Geologic Units Within the MPA and their PFYC Classes in Approximate Descending Stratigraphic Order

Age	Mapped Geologic Unit(S)	PFYC Class
Cretaceous	Mancos Shale - Sandstone Beds in Upper Shale Member	3
Cretaceous	Mancos Shale - Tununk Shale Member	3
Cretaceous	Castlegate Sandstone	2
Cretaceous	Blackhawk Formation	4/5
Cretaceous	Farrer Formation	4/5
Cretaceous	Neslen Formation	4/5
Cretaceous	Sego Sandstone	2
Cretaceous	Price River Formation-Upper part	3
Cretaceous	Tuscher Formation	3
Cretaceous	Blackhawk Formation and Star Point Sandstone	4/5
Cretaceous	Castlegate Sandstone and Blackhawk Formation, undivided	4/5
Cretaceous	Dakota Sandstone	3
Cretaceous	Dakota Sandstone and Cedar Mountain Formation, undivided	4/5
Cretaceous	Burro Canyon Formation	4/5
Cretaceous	Cedar Mountain Formation	5
Jurassic	Brushy Basin (Shale) Member of Morrison Formation	5
Jurassic	Salt Wash (Sandstone) Member of Morrison Formation	4/5
Jurassic	Tidwell Member of Morrison Formation	4/5
Jurassic	Summerville Formation and Morrison Formation-Tidwell and Salt Wash Members	4/5
Jurassic	Morrison Formation - Tidwell Member and Summerville Formation, undivided	3
Jurassic	Summerville Formation	3
Jurassic	Summerville and Curtis Formations, undivided	3
Jurassic	Carmel Formation-Dewey Bridge Member	2
Jurassic	Curtis Formation-Moab Member, Entrada Sandstone - Slick Rock Member, of Carmel Formation-Dewey Bridge Member	2
Jurassic	Upper Carmel Formation	2
Jurassic	Lower Carmel Formation	2
Jurassic	Curtis Formation	2
Jurassic	Curtis Formation-Moab Member	3
Jurassic	Entrada Sandstone	2
Jurassic	Entrada and Carmel Formations, undivided	2
Jurassic	Curtis Formation-Moab Member, Entrada Sandstone - Slick Rock Member	3

Table 4.61. Mapped Geologic Units Within the MPA and their PFYC Classes in Approximate Descending Stratigraphic Order

Age	Mapped Geologic Unit(S)	PFYC Class
Jurassic	Entrada Sandstone-Earthy Member	2
Jurassic	Entrada Sandstone-Slick Rock Member	2
Jurassic	Entrada Sandstone-Earthy Member and Entrada Sandstone-Slick Rock Member	2
Jurassic	Navajo Sandstone	2
Jurassic	Navajo Sandstone-Limestone beds	3
Triassic and Jurassic	Kayenta Formation	3
Triassic and Jurassic	Wingate Sandstone	2
Triassic	Chinle Formation	4/5
Triassic	Moenkopi Formation	3
Permian	Cutler Formation	3
Permian	Cutler Formation-Arkosic facies	3
Permian	Lower Cutler Group (Rico, Elephant Canyon, and Halgaito Formations)	3
Permian	White Rim Sandstone	3
Pennsylvanian	Honaker Trail Formation	2
Pennsylvanian	Honaker Trail Formation - Upper and Lower Members	2
Pennsylvanian	Honaker Trail Formation and Paradox Formation, undifferentiated	2
Pennsylvanian	Paradox Formation caprock	2
Proterozoic	Aplite and pegmatite	1
Proterozoic	Granite	1
Proterozoic	Quartz pegmatite	1
Proterozoic	Granodiorite and quartz diorite gneiss	1
Proterozoic	Felsic gneiss	1
Proterozoic	Diorite, gabbro, and quartz diorite	1
Proterozoic	Early Proterozoic rocks	1
Proterozoic	Biotite gneiss, gneiss, and schist	1
Proterozoic	Amphibole gneiss	1

Geologic mapping by Doelling 2002 (Moab and Eastern Part of San Rafael Desert 30' × 60' Quadrangle, scale 1:100,000); Doelling 2004 (La Sal 30' × 60' Quadrangle, scale 1:100,000); Witkind 2004 (Huntington 30' × 60' Quadrangle, scale 1:100,000); and Gualtieri 2004 (Westwater 30' × 60' Quadrangle, scale 1:100,000).

As discussed in Section 3.9.4.2, Class 1 geologic units have no sensitivity and no impact to paleontological resources is expected. Geologic units designated with a Class 2 have a low sensitivity, with little to low impact to paleontological resources anticipated. Class 3 geologic units have moderate sensitivity, and the risk of impacts to paleontological resources within these units is moderate. Class 4/5 and Class 5 geologic units have been designated high sensitivity units and have a high risk of adverse impacts. According to the PFYC (see Section 3.9.4.2 for

detailed discussion), Class 4 units are Class 5 units with lowered risks of adverse impacts due to local conditions such as surficial cover and topography. Furthermore, Class 4 designations should be made on an action-specific basis once a determination of lowered risks to the resource has been made. For this analysis, probable Class 4 units are designated as Class 4/5 in order to best accommodate the language of the PFYC with the more programmatic approach of this study. For the purposes of this analysis, Class 3, 4/5 and 5 are considered sensitive geologic units, and Class 4/5 and Class 5 are considered highly sensitive. Since the risk of adverse impacts to paleontological resources in Class 1 and Class 2 units is negligible, only impacts to Class 3, Class 4/5 and Class 5 units are reported in the impacts analysis sections.

Within the MPA, significant vertebrate and non-vertebrate paleontological resources are generally most abundant in the Chinle, Morrison, Cedar Mountain, Neslen, Farrer, North Horn, Green River, and Wasatch Formations (PFYC Classes 4/5 and 5); and are locally present but generally less abundant in the Cutler, Moenkopi, Kayenta, Summerville, Dakota, Tuscher, Price River, and Mancos Formations (PFYC Class 3). Significant vertebrate and non-vertebrate fossils occur but are generally uncommon in the Paradox, Honaker Trail, Wingate, Navajo, Entrada, and Carmel Formations, the Sego Sandstone and Geyser Creek Fanglomerate, and Pleistocene-age surficial deposits (PFYC Class 2). Significant vertebrate and non-vertebrate fossils do not occur in relatively young (Holocene-age) surficial deposits (PFYC Class 2), or in igneous and metamorphic rock units such as granite, pegmatite, gneiss, diorite and schist (PFYC Class 1).

4.3.9.2 Paleontological Resource Impacts

The loss of any identifiable fossil that could yield information important to prehistory, or that embodies the distinctive characteristics of a type of organism, environment, period of time, or geographic region, would be a significant adverse environmental impact. Direct adverse impacts on paleontological resources primarily concern the potential destruction of non-renewable paleontological resources and the loss of information associated with these resources. This includes the unlawful or unauthorized collection of fossil remains. If potentially fossiliferous bedrock or surficial sediments are disturbed, the disturbance could result in the destruction of paleontological resources and subsequent loss of information (adverse impact). Direct adverse impacts can typically be mitigated to below a level of significance through the implementation of paleontological mitigation.

Surface disturbance may result in the exposure of fossils that may never have been unearthed via natural processes. If mitigation measures are implemented, these newly exposed fossils become available for salvage, data recovery, scientific analysis, and preservation into perpetuity at a public museum (beneficial impact). The positive impacts of the results of mitigation include advances in scientific knowledge by both permitted field researchers and paleontologists who study fossils in museum collections, contributions to public education and interpretation, and community involvement and partnerships.

4.3.9.2.1 Direct Impacts to Paleontological Resources

Direct impacts result from activities planned or authorized by the BLM, and occur at the same time and place as the surface disturbing action. The potential for direct impacts on scientifically

significant surface and sub-surface fossils in fossiliferous sedimentary deposits is controlled by two factors. These include: 1) the depth and lateral extent of disturbance of fossiliferous bedrock and/or surficial sediments; and 2) the depth and lateral extent of occurrence of fossiliferous bedrock and/or surficial sediments beneath the surface. Ground disturbance has the potential to adversely impact an unknown quantity of fossils which may occur on or underneath the surface in areas containing paleontologically sensitive geologic units. Without mitigation, these fossils, as well as the paleontological data they could provide if properly salvaged and documented, could be destroyed, rendering them permanently unavailable for future scientific research.

4.3.9.2.2 Indirect Impacts to Paleontological Resources

Indirect impacts are caused by land management actions and occur later in time or further away in distance than direct impacts, but are still reasonably foreseeable. They typically include those impacts which result from the continuing implementation of management decisions and associated activities, and/or the normal ongoing operations of facilities constructed within a specific project area. An example of an indirect adverse impact on paleontological resources would be the construction of a new road which increases public access to a previously inaccessible area, and results in unauthorized fossil collecting and vandalism. Mitigation strategies could include surveys by permitted and qualified paleontologists to collect significant surface fossils, transfer them to a public museum, and identify locations of fossil localities which have the potential to yield additional fossils as erosion occurs; augmentation of law enforcement staff and increased patrols; and the construction of protective fencing or other barriers around known paleontological sites.

4.3.9.3 Impacts to Paleontological Resources Common to All Alternatives

Management Actions under all alternatives would comply with Federal laws, regulations and agency guidelines governing the use and protection of paleontological resources, including but not limited to FLPMA, NEPA, CFR Title 43, Section 8365.1-5, and the BLM Manual H-8270-1 (1998b). These authorities mandate and direct the treatment of paleontological resources in the MPA. Project-specific assessments and mitigation measures would be implemented wherever and whenever significant paleontological resources would be damaged or destroyed by surface disturbing actions.

Management strategies common to all alternatives for paleontological resources would have both long- and short-term beneficial impacts, and would lessen potential adverse impacts to below the level of significance. Each alternative promotes appropriate assessment to facilitate scientific research, encourages partnerships, manages access to significant fossils, reduces unauthorized use of paleontological resources, and provides for the mitigation of adverse impacts by qualified and permitted paleontologists where necessary and appropriate to protect them. Appropriate recreational use of common invertebrate and plant fossils is encouraged, as are public education and interpretation of paleontological resources.

The impacts of management actions related to fire management and paleontological resources on paleontological resources are common to all alternatives.

Management actions related to air quality, cultural resources, human health and safety, soils and watersheds, special status species, vegetation, visual resource management, and wildlife and fisheries, would have negligible impacts on paleontological resources, and therefore will not be further analyzed. The impacts of these actions would be negligible because protecting air quality, protecting cultural resources under section 106, maintaining safety around AML sites and reducing the risks of hazardous materials spills, protecting sensitive soils and water resources, protecting federally listed species and their habitat, restoring and maintaining native vegetation communities, protecting non-listed wildlife and fish habitats, and maintaining scenic quality would neither inhibit nor enhance opportunities for the scientific study of important fossil resources nor the opportunities for recreational collection of fossils.

4.3.9.3.1 Impacts of Fire Management Decisions on Paleontological Resources

Actions related to fire management could have long-term direct and indirect adverse and beneficial impacts on paleontological resources. Surface-disturbing actions such as road construction, the building of fire lines, and prescribed burns, could damage or destroy surface fossils in paleontologically sensitive areas/geologic units. In these areas, paleontological mitigation would reduce potential direct adverse impacts to below the level of significance. Potential long-term adverse indirect impacts would result from the construction of new fire roads, which would increase access to BLM lands that were previously less accessible to the public, thus increasing the potential for unauthorized fossil collecting and vandalism. The recovery and preservation of fossils as the result of paleontological mitigation would be a beneficial impact because it would permanently preserve paleontological resources which may have otherwise never been discovered, and make them available for scientific research, education and display.

4.3.9.3.2 Impacts of Paleontological Resources Decisions on Paleontological Resources

Paleontological resources identified as part of the Dinosaur Diamond National Prehistoric Byway would be recognized and protected. The Mill Canyon Dinosaur Trail, Copper Ridge Sauropod Trackway and Poison Spider Track Site would be managed as important scientific and public education resources as guided by future Special Recreation Management Area activity-level plans. All permitted activities would have lease notices and stipulations to prevent damage to paleontological resources. In areas where surface disturbance threatens significant fossils, current BLM paleontological resource management policy would be used to assess the threat and mitigate potential damage. Lands identified for disposal would be evaluated to determine whether such actions would remove significant fossils from Federal ownership. Appropriate (authorized under BLM regulations) recreational use of common invertebrate and plant fossils would be encouraged, as would public education and interpretation of paleontological resources. Commercial sales of petrified wood would be prohibited because of its limited availability. The casting of vertebrate fossils, including dinosaur tracks, would be prohibited unless allowed under a scientific research permit issued by the Utah State BLM Office. Paleontological Resource Use Permits issued and administered by the Utah State BLM Office for scientific research would provide important information to the BLM MFO about the locations (both geographic and stratigraphic) and kinds of significant paleontological resources in their jurisdiction, while

promoting and facilitating scientific research and education. Providing websites, local interpretive sites, and written information to the public about fossils and hobby collection would directly increase public knowledge of the earth sciences, encourage good stewardship, reduce illegal collection, and increase the likelihood that important paleontological discoveries would be reported to the BLM in the future.

4.3.9.4 ALTERNATIVES IMPACTS

This section summarizes the impacts of the proposed management actions under each alternative on paleontological resources. Because the analyses of the management actions presented in this chapter do not reflect specific projects or actions, some impacts can only be expressed qualitatively. In most cases, subsequent site-specific analyses would be required in order to implement resource management decisions. These analyses would address potential site-specific impacts on a variety of resources, including (if appropriate) paleontological resources.

4.3.9.4.1 IMPACTS OF LANDS AND REALTY DECISIONS ON PALEONTOLOGICAL RESOURCES

Generally, land acquisitions by the BLM would affect paleontological resources by increasing public access to areas that contain paleontologically-sensitive geologic units and areas that contain fossil localities. Public access to these areas could result in increased risk of adverse impact by the unauthorized collection or vandalism of paleontological resources. On the other hand, there would be an opportunity for the BLM to establish stewardship of paleontological resources on these newly acquired lands. This stewardship would include access to these lands by permitted paleontological researchers, and the resulting associated educational benefits including interpretive opportunities and the permanent storage of scientifically-significant fossils collected in public museums (beneficial impact). Transfer of BLM (public) lands to private ownership would have long-term indirect and cumulative adverse impacts on paleontological resources by removing scientifically-significant fossils from the public domain, thus rendering them permanently unavailable for scientific research and education. As discussed above, paleontological mitigation would reduce adverse impacts to below the level of significance by ensuring the preservation of fossils in a public museum where they would be available for scientific research, education and display. Lands and Realty management actions under each alternative concern proposals for utility corridors and LTAs.

4.3.9.4.1.1 Alternative A

Actions related to lands and realty under Alternative A would have long-term indirect adverse and beneficial impacts on paleontological resources. The utility corridors proposed under Alternative A are one mile wide. Of all the alternatives, Alternative A provides for the least amount of land to be available for use as utility corridors in areas containing paleontologically sensitive geologic units (21,701 acres). Of these, 4,110 acres are in areas containing highly sensitive geologic units. Thus, this alternative has the lowest potential for direct adverse impacts on paleontological resources as it could result in the least amount of surface-disturbance associated with construction within these utility corridors. This surface disturbance has the potential to damage or destroy an unknown quantity of scientifically significant fossils. New utility corridors would also facilitate greater commercial and public access to BLM lands via

associated access routes, thus increasing the potential for unauthorized fossil collecting and vandalism (indirect adverse impact).

4.3.9.4.1.2 Alternative B

Under Alternative B an I-70 utility corridor would be designated that includes all existing rights-of-way identified in the existing RMP with a 100 foot width on each side of the widest Right-of-Way corridor, the existing Moab Canyon utility corridor would be designated, and the utility corridor south of Spanish Valley would be split into two corridors identical to the existing corridors. Of all the alternatives, Alternative B opens the second lowest acreage for use as utility corridors in areas containing paleontologically sensitive geologic units (38,633 acres). Of these, 5,482 acres are in areas containing highly sensitive geologic units. Thus, this alternative has the second lowest potential behind Alternative A for direct adverse impacts on paleontological resources.

4.3.9.4.1.3 Alternative C

Under Alternative C an I-70 utility corridor would be designated that includes all major existing rights-of-way identified with a 100 foot widths on each side of the widest Right-of-Way corridor, the existing Moab Canyon utility corridor would be designated, and the two utility corridors south of Spanish Valley would be combined into a single corridor that would include the approximately 2 to 3 miles separating the two segments. Of all the alternatives, Alternative C opens the second highest acreage for use as utility corridors in areas containing paleontologically sensitive geologic units (101,359 acres). Of these, 24,313 acres are in areas containing highly sensitive geologic units. Thus, this alternative has the second highest potential behind Alternative D for direct adverse impacts on paleontological resources.

4.3.9.4.1.4 Alternative D

Under Alternative D the configurations of the proposed utility corridors are identical to those under Alternative C, although the width is double. Of all the alternatives, Alternative D provides for the highest amount of land to be available for use as utility corridors in areas containing paleontologically sensitive geologic units (123,132 acres). Of these, 24,887 acres are in areas containing highly sensitive geologic units. Thus, this alternative has the highest potential for direct adverse impacts on paleontological resources.

4.3.9.4.2 Impacts of Livestock Grazing Decisions on Paleontological Resources

Under each alternative, livestock grazing would be managed according to BLM guidelines for Grazing Management to achieve Standards for Rangeland Health. Livestock grazing management actions under each alternative concern amounts of acreage available for livestock grazing with the MPA as well as seasonal grazing restrictions.

4.3.9.4.2.1 Alternative A

Actions related to livestock grazing under Alternative A could have direct and indirect adverse impacts on paleontological resources if grazing occurs in areas containing occurrences of scientifically-significant surface fossils. This is because damage or destruction of surface fossils is known to occur as a result of trampling by livestock. Generally, grazing would be evaluated for significant paleontological resources if they occur in areas containing paleontologically sensitive units. Avoidance of sensitive resources could be accomplished with the construction of fencing or other barriers around known fossil localities. However, this could lead to an increased risk of unauthorized collecting or vandalism of the resources as it would increase their visibility.

Of all the alternatives, Alternative A has the second least possibility for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it opens the second least area (1,695,621 acres) to livestock grazing which could result in the destruction of some surface-occurring fossils by trampling. Of these, 394,972 acres are located in areas containing highly sensitive geologic units.

4.3.9.4.2.2 Alternative B

Of all the alternatives, Alternative B has the lowest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because the smallest area (1,668,732 acres) is potentially available for livestock grazing, thus creating the least likelihood of inadvertent surface fossil destruction by trampling. Of these, 394,718 acres are located in areas containing highly sensitive geologic units.

4.3.9.4.2.3 Alternative C

Of all the alternatives, Alternative C has the third lowest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because the third smallest area (1,708,294 acres) behind Alternatives B and C is potentially available for livestock grazing, thus creating the second lowest likelihood of inadvertent surface fossil destruction by trampling. Of these, 394,841 acres are located in areas containing highly sensitive geologic units.

4.3.9.4.2.4 Alternative D

Of all the alternatives, Alternative D has the highest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because the largest area (1,770,314 acres) is potentially available for livestock grazing, thus creating the highest likelihood of inadvertent surface fossil destruction by trampling. Of these, 394,832 acres are located in areas containing highly sensitive geologic units.

4.3.9.4.3 Impacts of Mineral Decisions on Paleontological Resources

Management actions related to mineral development would provide for a variety of mineral exploration and development activities for leasable, locatable and salable minerals. Because of the potential large scale surface disturbance resulting from leasable oil and gas exploration and

development, this category is analyzed quantitatively and separately from other mineral types. Because mineral exploration and development activities, including geophysical surveys, typically involve significant amounts of surface disturbance, adverse impacts on paleontological resources would result under all alternatives without mitigation. Commercial exploration and development of BLM lands for energy resources would have both direct and indirect adverse impacts on paleontological resources. Surface disturbing activities associated with exploration and development could damage or destroy scientifically-significant surface and sub-surface fossils (direct adverse impact). The ongoing operations of commercial energy facilities and associated infrastructure on BLM lands would have indirect adverse impacts on paleontological resources by increasing access to lands that were previously inaccessible through new road development, thus increasing the likelihood of unauthorized fossil collecting and vandalism. These impacts are most likely to occur in paleontologically sensitive units which are designated as Class 3, 4/5 and 5. Therefore, the sensitivities of geologic units and surface acreage eligible for minerals exploration and development is of critical consideration when analyzing potential impacts to paleontological resources.

4.3.9.4.3.1 Alternative A

The number of acres open to oil and gas leasing under both standard and special stipulations on BLM lands within each RFD area under Alternative A and corresponding paleontological sensitivities of geologic units are provided in Table 4.62.

Table 4.62. Proposed Acreages per PFYC Classes Open to Oil and Gas Leasing Under Alternative A for Each of the RFD Areas Within the MPA

	Class 1	Class 2	Class 3	Class 4/5	Class 5
Bigflat	3,875	123,354	79,179	19,838	5,809
Bookcliffs	n/a	22,427	65,766	62,458	n/a
Eastern Paradox	16,665	200,657	224,685	52,718	31,777
Greater Cisco	77	52,246	147,512	11,443	4,424
Hatch Point	597	93,016	32,656	3,557	162
Lisbon Valley	n/a	56,059	16,282	35,930	6,133
Roan Cliffs	n/a	86	1,965	1,098	n/a
Salt Wash	6,561	11,107	7,472	11,782	15,766
Total	**27,775**	**558,952**	**575,517**	**198,824**	**64,071**

See Section 3.9.4.2 for detailed PFYC class descriptions (*Class* 1 = no sensitivity, no anticipated impact; *Class* 2 = low sensitivity, little to low anticipated impact; *Class* 3 = moderate sensitivity, moderate anticipated impact; *Class* 4/5 = high sensitivity, high anticipated impact, but sensitivity level may be lowered based on site-specific assessments; *Class* 5 = high sensitivity, high anticipated impact.

Of all the alternatives, Alternative A has the highest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it opens the largest area (838,412 acres) to oil and gas leasing. Of these 838,412 acres in paleontologically sensitive geologic units, 262,895 acres are located in areas containing *highly* sensitive geologic units (Classes 4/5 and 5). For Alternative A, the Eastern Paradox RFD area has the highest potential for adverse impacts on paleontological resources because it contains the largest acreage

of sensitive geologic units, followed in descending order by the Greater Cisco, Bookcliffs, Bigflat, Lisbon Valley, Hatch Point, Salt Wash, and Roan Cliffs RFD areas.

Under Alternative A, 2,397 acres of BLM Lands (3,504 acres of all lands) would be open to geophysical exploration within the MPA. Alternative A would have the highest potential for adverse impacts on surface fossils because it makes the most amount of land available for geophysical surveys.

4.3.9.4.3.2 Alternative B

The number of acres open to oil and gas leasing under both standard and special stipulations within each RFD area under Alternative B and corresponding paleontological sensitivities of geologic units are provided in Table 4.63.

Table 4.63. Proposed Acreages per PFYC Classes Open to Oil and Gas Leasing Under Alternative B for Each of the RFD Areas Within the MPA

	Class 1	Class 2	Class 3	Class 4/5	Class 5
Bigflat	624	53,742	26,779	2,472	1,249
Bookcliffs	n/a	15,959	41,642	38,562	n/a
Eastern Paradox	12,566	120,870	133,236	33,790	29,574
Greater Cisco	26	22,819	65,729	8,916	3,276
Hatch Point	598	53,502	11,370	1,752	162
Lisbon Valley	n/a	54,243	15,259	35,213	6,134
Roan Cliffs	6	n/a	1,392	n/a	n/a
Salt Wash	4,607	9,199	6,626	10,155	13,939
Total	**18,427**	**330,334**	**302,033**	**130,860**	**54,334**

See Section 3.9.4.2 for detailed PFYC class descriptions (*Class* 1 = no sensitivity, no anticipated impact; *Class* 2 = low sensitivity, little to low anticipated impact; *Class* 3 = moderate sensitivity, moderate anticipated impact; *Class* 4/5 = high sensitivity, high anticipated impact, but sensitivity level may be lowered based on site-specific assessments; *Class* 5 = high sensitivity, high anticipated impact.

Of all the alternatives, Alternative B has the lowest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it opens the smallest area (487,227 acres) to oil and gas leasing. Of these 487,227 acres in paleontologically sensitive geologic units, 185,194 are located in areas containing *highly* sensitive geologic units (Classes 4/5 and 5). For Alternative B, the Eastern Paradox RFD area has the highest potential for adverse impacts on paleontological resources because it contains the largest acreage of sensitive geologic units, followed in descending order by the Bookcliffs, Greater Cisco, Lisbon Valley, Salt Wash, Bigflat, Hatch Point, and Roan Cliffs RFD areas.

Under Alternative B, 1,404 acres of BLM Lands (2,052 acres of all lands) would be open to geophysical exploration within the MPA. Alternative B would have the lowest potential for adverse impacts on surface fossils because it makes the least amount of land available for geophysical surveys.

4.3.9.4.3.3 Alternative C

The number of acres open to oil and gas leasing under both standard and special stipulations within each RFD area under Alternative C and corresponding paleontological sensitivities of geologic units are provided in Table 4.64.

Table 4.64. Proposed Acreages per PFYC Classes Open to Oil and Gas Leasing Under Alternative C for Each of the RFD Areas Within the MPA

	Class 1	Class 2	Class 3	Class 4/5	Class 5
Bigflat	1,039	87,866	40,552	5,325	4,668
Bookcliffs	n/a	22,817	65,874	61,670	n/a
Eastern Paradox	15,207	160,346	183,712	45,612	31,262
Greater Cisco	77	52,825	148,282	11,733	4,434
Hatch Point	598	90,198	31,284	3,516	162
Lisbon Valley	n/a	55,884	16,040	35,825	6,135
Roan Cliffs	n/a	93	2,053	1,260	n/a
Salt Wash	5,220	11,402	6,627	10,159	14,273
Total	**22,141**	**481,431**	**494,424**	**175,100**	**60,934**

See Section 3.9.4.2 for detailed PFYC class descriptions (*Class* 1 = no sensitivity, no anticipated impact; *Class* 2 = low sensitivity, little to low anticipated impact; *Class* 3 = moderate sensitivity, moderate anticipated impact; *Class* 4/5 = high sensitivity, high anticipated impact, but sensitivity level may be lowered based on site-specific assessments; *Class* 5 = high sensitivity, high anticipated impact.

Of all the alternatives, Alternative C has the second lowest potential behind Alternative B for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it opens the second smallest area (730,458 acres) to oil and gas leasing. Of these 730,458 acres in paleontogically sensitive geologic units, 236,034 are located in areas containing *highly* sensitive geologic units (Classes 4/5 and 5). For Alternative C, the Eastern Paradox RFD area has the highest potential for adverse impacts on paleontological resources because it contains the largest acreage of sensitive geologic units, followed in descending order by the Greater Cisco, Bookcliffs, Lisbon Valley, Bigflat, Hatch Point, Salt Wash, and Roan Cliffs RFD areas.

Under Alternative C, 2,072 acres of BLM Lands (3,029 acres of all lands) would be open to geophysical exploration within the MPA. Alternative C would have the second lowest potential behind Alternative B for adverse impacts on surface fossils because it makes the second least amount of land available for geophysical surveys.

4.3.9.4.3.4 Alternative D

The number of acres open to oil and gas leasing under both standard and special stipulations within each RFD area under Alternative D and corresponding paleontological sensitivities of geologic units are provided in Table 4.65.

Table 4.65. Proposed Acreages per PFYC Classes Open to Oil and Gas Leasing Under Alternative D for Each of the RFD Areas Within the MPA

	Class 1	Class 2	Class 3	Class 4/5	Class 5
Bigflat	3,807	116,602	73,397	17,106	5,612
Bookcliffs	n/a	22,818	66,798	62,584	n/a
Eastern Paradox	16,528	191,309	210,985	50,248	31,926
Greater Cisco	76	52,880	148,291	11,737	4,433
Hatch Point	598	93,099	32,532	3,547	162
Lisbon Valley	n/a	55,888	16,051	35,837	6,135
Roan Cliffs	n/a	93	2,238	1,385	n/a
Salt Wash	6,465	11,782	7,308	11,324	15,103
Total	27,474	544,471	557,600	193,768	63,371

See Section 3.9.4.2 for detailed PFYC class descriptions (*Class* 1 = no sensitivity, no anticipated impact; *Class* 2 = low sensitivity, little to low anticipated impact; *Class* 3 = moderate sensitivity, moderate anticipated impact; *Class* 4/5 = high sensitivity, high anticipated impact, but sensitivity level may be lowered based on site-specific assessments; *Class* 5 = high sensitivity, high anticipated impact.

Of all the alternatives, Alternative D has the second highest potential behind Alternative A for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it opens the second largest area (814,739 acres) to oil and gas leasing. Of these 814,739 acres in paleontogically sensitive geologic units, 257,139 are located in areas containing *highly* sensitive geologic units (Classes 4/5 and 5). For Alternative D, the Eastern Paradox RFD area has the highest potential for adverse impacts on paleontological resources because it contains the largest acreage of sensitive geologic units, followed in descending order by the Greater Cisco, Bookcliffs, Bigflat, Lisbon Valley, Hatch Point, Salt Wash, and Roan Cliffs RFD areas.

Under Alternative D, 2,309 acres of BLM Lands (3,405 acres of all lands) would be open to geophysical exploration within the MPA. Alternative D would have the second highest potential behind Alternative A for adverse impacts on surface fossils because it makes the second least amount of land available for geophysical surveys.

4.3.9.4.4 Impacts of Non-WSA Lands With Wilderness Characteristics Decisions on Paleontological Resources

Prescriptions for non-WSA lands with wilderness characteristics would generally have long-term beneficial impacts on paleontological resources that occur within their boundaries. Impacts to paleontological resources vary among alternatives based on the acreage managed for wilderness characteristics and the oil and gas leasing stipulations assigned within them.

4.3.9.4.4.1 Alternative A

Alternative A would manage no lands to protect non-WSA lands with wilderness characteristics. Therefore, no restrictions on surface disturbing activities would be imposed in Alternative A as a

result of wilderness characteristics decisions and inadvertent adverse impacts to paleontological resources could occur.

4.3.9.4.4.2 Alternative B

Alternative B would manage 266,485 acres to protect non-WSA lands with wilderness characteristics. These lands would be managed as closed to oil and gas leasing and with no surface disturbance allowed by other surface disturbing activities. These restrictions would protect paleontological resources by precluding surface disturbing activities.

4.3.9.4.4.3 Alternative C

Alternative C would manage 47,761 acres (in Beaver Creek, Fisher Towers and Mary Jane) to protect non-WSA lands with wilderness characteristics. These lands would be managed as NSO for oil and gas leasing and by precluding other surface disturbing activities. These restrictions would protect paleontological resources by precluding surface disturbing activities.

4.3.9.4.4.4 Alternative D

Alternative D would manage no lands to protect non-WSA lands with wilderness characteristics. Therefore, no restrictions on surface disturbing activities would be imposed in Alternative D as a result of wilderness characteristics decisions and inadvertent adverse impacts to paleontological resources could occur.

4.3.9.4.5 Impacts of Riparian Decisions on Paleontological Resources

Under all alternatives, riparian areas would be managed for properly functioning condition and management actions would ensure that stream channel morphology and functions are appropriate for local soil types, climates, and landforms. The loss or degradation of riparian areas, wetlands and associated floodplains would be avoided or minimized; natural and beneficial values would be preserved and enhanced; and fish, wildlife and special status species would be provided for. Specifically, management of riparian areas under each alternative concerns the amount of land in riparian areas that could be available for grazing and the seasonal availability of these areas.

Wherever riparian areas are underlain by paleontologically sensitive geologic units, surface disturbance (including ROWs) within these areas has the potential to adversely impact paleontological resources due to the trampling, breakage and crushing of fossil remains. Mitigation would include field surveys to collect significant surface fossils and associated data from bedrock exposures within areas that could be subject to trampling, and the transfer of all collected fossils to a public museum for curation and permanent storage. As an alternative mitigation avoidance of sensitive resources could be accomplished with the construction of fencing or other barriers around known fossil localities. However, this could lead to an increased risk of unauthorized collecting or vandalism of the resources as it would increase their visibility.

4.3.9.4.5.1 Alternative A

Under Alternative A, the Between the Creeks, North Sand Flats, South Sand Flats, Cottonwood and Diamond allotments would not be available for grazing to benefit riparian resources, and the Spring Creek, Castle Valley, Pear Park and Bogart allotments would continue to be managed as not available for grazing in order to protect riparian resources. Of all the alternatives, Alternative A places the fewest possible restrictions on grazing in riparian areas, both geographically and seasonally, and would therefore have the highest probability of short- and long-term direct adverse impacts on paleontological resources, although since most paleontological resources are subsurface, impacts would be minor.

4.3.9.4.5.2 Alternative B

Under Alternative B, grazing within riparian areas would be evaluated for exclusion from the following drainages with the installation of fencing while allowing for water access: Ten Mile from Dripping Spring to the Green River, Lower Gray Canyon of the Green River, Day Canyon, Mill Creek, Seven Mile Canyon, East Coyote, Kane Springs, and Hatch Wash (4,422 acres. Development and implementation of the Watershed Management Plans and riparian studies for the following areas would be prioritized: Mill Creek (including North Fork, Rill, and Burkholder), Ten Mile Wash, Kane Springs, White Wash, Bartlett Wash, Tusher Wash, Mill Canyon, Courthouse Wash, Professor Creek, Negro Bill Canyon, Cottonwood/Diamond, Spring Canyon, Red Wash, Green River, Colorado River, Onion Creek and Westwater Creek. Of all the alternatives, Alternative B places the most restrictions on grazing in riparian areas, both geographically and seasonally, and would therefore have the lowest probability of short- and long-term direct adverse impacts on paleontological resources.

4.3.9.4.5.3 Alternative C

Under Alternative C, grazing in riparian areas would be evaluated for restriction while allowing for water access in the following drainages: Ten Mile from Dripping Spring to the Green River, Mill Creek, Seven Mile Canyon, and East Coyote (1,169 acres). Restrictions could include the development of an Allotment Management Plan, changing seasons of use, restricting the intensity of grazing, and the installation of fencing or other forms of exclusion. The development and implementation of the Watershed Management Plans and riparian studies for the following areas would be prioritized: Ten Mile Wash, Kane Springs, Bartlett Wash, Tusher Wash, Mill Canyon, Courthouse Wash, Cottonwood-Diamond, and Onion Creek. Of all the alternatives, Alternative C places the second most restrictions on grazing in riparian areas behind Alternative B, both geographically and seasonally, and would therefore have the second lowest probability of short- and long-term direct adverse impacts on paleontological resources.

4.3.9.4.5.4 Alternative D

Under Alternative D, grazing management in riparian areas would be identical as described in Alternative A. Watershed Management Plans would not be prioritized. Of all the alternatives, Alternative D places the second fewest restrictions on grazing in riparian areas behind Alternative B, both geographically and seasonally, and would therefore have the second highest

probability behind Alternative A for short- and long-term direct adverse impacts on paleontological resources.

4.3.9.4.6 Impacts of Special Designations Decisions on Paleontological Resources

Management of special designations could have indirect adverse and beneficial impacts on paleontological resources. For the purpose of this analysis, Special Designations fall into three categories: Areas of Critical Environmental Concern (ACECs), Wild and Scenic Rivers (WSRs), and Wilderness Study Areas (WSAs). There are 14 potential ACECs, 13 WSRs, and 10 WSAs within the MPA. To the extent that Special Designations in paleontologically sensitive areas/geologic units result in restricted public access and use, and prohibit surface disturbing actions, paleontological resources would be less likely to be unlawfully collected or vandalized, or damaged or destroyed by vehicular traffic or construction. Therefore, in this general sense, Special Designations represent a beneficial impact on paleontological resources because they lessen the probability of their permanent loss to science and education. If public access to Special Designation areas such as ACECs is encouraged, and surface disturbing actions are permitted, adverse direct and indirect impacts on paleontological resources could occur.

For all alternatives, there are 343,997 total acres designated as WSAs. Table 4.66 shows the acreage of paleontologically sensitive areas contained within each WSA in the MPA.

Table 4.66. WSA Acreages by PFYC Class

WSA	Total acreage	Class 1	Class 2	Class 3	Class 4/5
Behind the Rocks WSA	13,056		9,044	3949	64
Black Ridge Canyons WSA	57		52	5	
Coal Canyon WSA	60,599		1,409	18,066	41,124
Desolation Canyon WSA	81,363		828	37,392	43,060
Floy Canyon WSA	71,899		2,310	24,849	44,740
Flume Canyon WSA	47,823		909	17,098	29,816
Lost Spring Canyon WSA	1,625	368	399	858	
Mill Spring Canyon WSA	9,841	380	5,953	3,507	1
Negro Bill Canyon WSA	7,557		3,630	3,880	46
Spruce Canyon WSA	20,263			7,327	12,937
Westwater Canyon WSA	29,914	4,998	10,020	11,803	2,748
Total	**343,997**	**5,746**	**34,554**	**128,734**	**174,536**

See Section 3.9.4.2 for detailed PFYC class descriptions (*Class* 1 = no sensitivity, no anticipated impact; *Class* 2 = low sensitivity, little to low anticipated impact; *Class* 3 = moderate sensitivity, moderate anticipated impact; *Class* 4/5 = high sensitivity, high anticipated impact, but sensitivity level may be lowered based on site-specific assessments; *Class* 5 = high sensitivity, high anticipated impact.

For all alternatives, there are 5,106 total acres of designated wilderness (Colorado Canyon National Conservation Area) within the MPA. These include 871 acres underlain by Class 2 geologic units, 4,230 acres underlain by Class 3 geologic units, and 5 acres underlain by Class 4/5 geologic units. Thus, the designated wilderness provides some protection for paleontological resources.

4.3.9.4.6.1 Alternative A

Under Alternative A, no areas are designated as ACECs. The Negro Bill Canyon Outstanding Natural Area is the only special designation. This area encompasses a total of 1,287 acres. It is underlain by 726 acres of Class 2 geologic units, and 561 acres of Class 3 geologic units. Of all the alternatives, Alternative A designates the second smallest amount of BLM lands as special designations and/or ACECs, and thus has the second highest potential for adverse impacts on significant paleontological resources because it would provide the second least amount of restrictions on land access and use.

There are no rivers that would be managed as suitable for Congressional designation into the National Wild and Scenic Rivers System under Alternative A, However, because all eligible rivers would, by BLM policy, continue to be managed in a protective manner until suitability could be determined, paleontological values would benefit from that protection.

4.3.9.4.6.2 Alternative B

Under Alternative B, a total of 71,072 acres are would be determined and managed as suitable for congressional WSR designation with recreational, scenic and wild classifications. Of these, 2,864 acres are underlain by Class 1 geologic units, 25,257 acres are underlain by Class 2 geologic units, 21,962 acres are underlain by Class 3 geologic units, 14,128 acres are underlain by Class 4/5 geologic units, and 1,864 acres are underlain by Class 5 geologic units. Because no eligible rivers would be determined as suitable for congressional designation as WSRs under Alternatives A and D, and less acreage would be determined suitable and managed in a protective manner under Alternative C, Alternative B would be most protective of paleontological resources because it determines and manages the most acreage as suitable

Under Alternative B, 14 ACECs are designated encompassing a total area of 610,703 acres. Of these, 4,483 acres are underlain by Class 1 geologic units, 118,323 acres are underlain by Class 2 geologic units, 273,861 acres are underlain by Class 3 geologic units, 195,305 acres are underlain by Class 4/5 geologic units, and 5,325 acres are underlain by Class 5 geologic units. Of all the alternatives, Alternative B designates the largest acreage of BLM lands as ACECs, and thus has the lowest potential for adverse impacts on significant paleontological resources because it would provide the most restrictions on land access and use, such as NSO or closed for mineral development.

4.3.9.4.6.3 Alternative C

Under Alternative C, a total of 41,495 acres are proposed as suitable for congressional wild and scenic river designation with recreational, scenic and wild classifications. Of these, 2,651 acres

are underlain by Class 1 geologic units, 15,546 acres are underlain by Class 2 geologic units, 11,122 acres are underlain by Class 3 geologic units, 6,209 acres are underlain by Class 4/5 geologic units, and 1,338 acres are underlain by Class 5 geologic units. Because no rivers would be determined suitable and managed in a protective manner under Alternative D, and the highest amount of acreage would be managed as suitable for congressional wild and scenic designation under Alternative B, Alternative C has less potential than Alternative B but more potential than Alternative D to protect paleontological values from adverse surface-disturbing impacts. Alternative A is probably more protective than C, because all rivers would continue to be managed in a protective manner until suitability determinations can be made.

Under Alternative C, 5 ACECs are designated encompassing a total area of 63,781 acres. Of these, 131 acres are underlain by Class 1 geologic units, 9,632 acres are underlain by Class 2 geologic units, 24,079 acres are underlain by Class 3 geologic units, 24,324 acres are underlain by Class 4/5 geologic units, and 0 acres are underlain by Class 5 geologic units. Of all the alternatives, Alternative C designates the second largest acreage of BLM lands as ACECs behind Alternative B, and thus has the second lowest potential for adverse impacts on significant paleontological resources because it would provide the second most amount of restrictions on land access and use, such as NSO or closed for mineral development.

4.3.9.4.6.4 Alternative D

There would be no rivers determined suitable and managed in a protective manner under Alternative D. Therefore, there is a higher potential for adverse impacts on paleontological resources than Alternatives B and C.

There are no ACECs (or ONAs) designated under Alternative D as this alternative has the highest potential for adverse impacts on significant paleontological resources because it would provide the least amount of restrictions on land access and use, such as NSO or closed for mineral development.

4.3.9.4.7 Impacts of Recreation and Travel Management Decisions on Paleontological Resources

Under each alternative, decisions related to travel management would provide opportunities for a range of motorized recreation experiences on public lands while protecting resources and minimizing conflicts among various users. Specifically, travel management under each alternative address OHV use for both motorized and mechanized (e.g., mountain bikes) travel. All BLM lands would be designated as open, limited to designated routes, or closed. Areas that are either open to OHV use or limit OHV use to designated routes have the potential to adversely impact paleontological resources due to the resulting surface disturbance, and are analyzed separately below.

Generally, the construction of travel infrastructure such as roads, trails, and trailheads would be associated with construction-related surface disturbance that could damage or destroy fossils in paleontologically sensitive areas/geologic units. The designation of new routes for motorized and non-motorized travel would facilitate access to areas that were previously prohibited or

inaccessible. This would also increase the potential for adverse direct impacts on surface fossils in paleontologically sensitive areas/geologic units. The overall increase in public access to BLM lands associated with travel management would increase the potential for unauthorized fossil collecting and vandalism.

4.3.9.4.7.1 Alternative A

Impacts related to travel management under Alternative A include potential adverse direct and indirect impacts on paleontological resources associated with damage by vehicles, and increased public access to BLM lands resulting in a greater potential for unauthorized fossil collecting or vandalism. Interpretive signs and displays in paleontologically sensitive areas, as well as the encouragement of lawful collecting of invertebrate and plant fossils, could foster a greater overall appreciation for paleontological resources and their scientific significance.

Of all the alternatives, Alternative A has the highest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it opens the largest area (391,133 acres) to unrestricted OHV travel, and hence provides the greatest amount of access to the general public. This increases the potential for damage and destruction of surface fossils by running over them with motorized vehicles and crushing them, as well as unauthorized fossil collection and vandalism. Of these 391,133 acres in paleontologically sensitive geologic units, 182,687 are located in areas containing highly sensitive geologic units.

Alternative A designates 764,260 acres in paleontologically sensitive geologic units as limited to designated, existing or inventoried routes.

4.3.9.4.7.2 Alternative B

Of all the alternatives, Alternative B has the lowest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it designates no lands as open to cross country OHV travel. Thus it prevents greater access to the general public which would increase the potential for damage and destruction of surface fossils by crushing, as well as unauthorized fossil collection and vandalism. Alternative B designates 860,291 acres in paleontologically sensitive geologic units as limited to designated routes. This alternative has the lowest overall potential for adverse impacts on paleontological resources. Of the 860,291 acres in paleontologically sensitive geologic units, 270,937 are located in areas containing highly sensitive geologic units.

4.3.9.4.7.3 Alternative C

Of all the alternatives, Alternative C has the second lowest potential behind Alternative B for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it designates the second smallest area (7 acres in paleontologically sensitive geologic units) as open to cross country OHV travel. Thus it provides less access to the general public than alternatives A and D, decreasing the potential for damage and destruction of surface fossils by crushing, as well as unauthorized fossil collection and vandalism. None of the 7 acres in paleontologically sensitive geologic units are located in areas containing highly sensitive

geologic units. Alternative C designates 831,367 acres in paleontologically sensitive geologic units to OHV travel limited to designated routes. This alternative has the third lowest overall potential for adverse impacts on paleontological resources. Of the 831,367 acres in paleontologically sensitive geologic units, 243,797 are located in areas containing highly sensitive geologic units.

4.3.9.4.7.4 Alternative D

Of all the alternatives, Alternative D has the second highest potential behind Alternative A for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it designates the second largest area (38 acres in paleontologically sensitive geologic units) as open to cross country OHV travel. This provides the second greatest amount of access to the general public, which increases the potential for damage and destruction of surface fossils by crushing, as well as unauthorized fossil collection and vandalism. It should be noted that although Alternative D has the second highest potential for adverse impacts behind Alternative A, Alternative D involves a much smaller area (38 acres in paleontologically sensitive geologic units) that is much closer is size to alternatives B (0 acres) and C (7 acres in paleontologically sensitive geologic units), than A (391,133 acres in paleontologically sensitive geologic units). Alternative D designates 1,142,781 acres in paleontologically sensitive geologic units as limited to designated routes. This has the second highest overall potential for adverse impacts on paleontological resources. Of the 1,142,781 acres in paleontologically sensitive geologic units, 443,037 are located in areas containing highly sensitive geologic units.

4.3.9.4.8 Impacts of Woodlands Decisions on Paleontological Resources

Management of woodlands involves the harvesting of woodlands products for commercial and recreational uses on lands managed by the MFO. In general, the increase in public access resulting from new as well as existing routes would have indirect adverse impacts on paleontological resources because it could increase the potential for unauthorized fossil collecting and vandalism. On the other hand, an increase in public access could also benefit qualified and BLM-permitted paleontological researchers who are interested in conducting field research in the area, and facilitate the collection and study of fossils which may have otherwise never been discovered. The implementation of paleontological mitigation measures in paleontologically sensitive areas/geologic units prior to and during the construction of new roads and other surface disturbing activities related to woodlands management would reduce potential adverse direct and indirect impacts on paleontological resources to below the level of significance.

4.3.9.4.8.1 Alternative A

Actions related to management of woodlands under Alternative A would have direct adverse impacts on paleontological resources due to surface-disturbing actions associated with woodlands harvest. Of all the alternatives, Alternative A has the highest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it would result in the largest possible area (760,344 acres) of surface disturbance resulting from

activities associated with woodlands product harvest. Of these, 249,548 acres are located in areas containing highly sensitive geologic units.

4.3.9.4.8.2 Alternative B

Of all the alternatives, Alternative B has the lowest potential for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it would result in the smallest possible area (614,848 acres) open to surface disturbing activities associated with woodlands harvest. Of these, 201,649 acres are located in areas containing highly sensitive geologic units.

4.3.9.4.8.3 Alternative C

Of all the alternatives, Alternative C has the second lowest potential behind Alternative B for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it would result in the second possible smallest area (737,198 acres) open to surface disturbing activities associated with woodlands harvest. Of these, 241,866 acres are located in areas containing highly sensitive geologic units.

4.3.9.4.8.4 Alternative D

Of all the alternatives, Alternative D has the second highest potential behind Alternative A for adverse impacts on paleontological resources in paleontologically sensitive geologic units because it would result in the second possible largest area (760,198 acres) open to surface disturbing activities associated with woodlands harvest. Of these, 241,866 acres are located in areas containing highly sensitive geologic units, thus, impacts to highly sensitive paleontological resources would be the same as Alternative C.

4.3.9.5 Summary of Impacts to Paleontological Resources

The impacts of implementing fire management, paleontological resources, lands and realty, livestock grazing, minerals development, riparian, special designations, travel management, wilderness characteristics, and woodlands decisions under all four alternatives are summarized in Table 2.2, located in Chapter 2. Those activities and alternatives which maximize the possibility of surface disturbing activities provide the highest probability of adverse impacts to paleontological resources. Alternative B provides the most protection for these resources, followed by Alternatives C, D and A, in that order.

4.3.10 RECREATION

This section discusses impacts to recreation from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning recreation are described in Chapter 3. The assumptions discussed below were made in order to analyze the level of impacts the proposed RMP management actions would have on recreational resources, opportunities, and expectations and on the likelihood for user satisfaction. Recreational resources are defined as the natural elements within the environment that provide the physical basis for recreation. Recreational opportunities are defined as the combination of the natural elements (e.g., scenery, vegetation, geology, land forms, weather) and human-controlled conditions (e.g., roads and trails, developed sites, signs, route markers, facilities) that create the potential for recreation. Recreational expectations are those assumptions made by the recreation resource user (e.g., the hiker, mountain biker, the scenic driver, etc.) that, having prepared for the desired recreational experience (e.g., choosing a recreation site, traveling to the site) and having entered the area of opportunity, he/she would have that desired experience (e.g., the natural sights and sounds of an undeveloped landscape along a hiking trail or an un-crowded and challenging mountain biking or driving while enjoying high quality scenery). It is important to note that achieving recreational expectations are not guaranteed even though the MFO manages the resource for a wide range of recreational opportunities. Unforeseen and/or changing conditions that are beyond the control of the BLM can influence and partially determine what the user experiences. Recreational user satisfaction can be defined as that subjective mental state in which the resource user is able to successfully benefit from the available recreational opportunities and recognizes that his/her recreational experiences meet or exceed his/her recreational expectations.

- While recognizing that recreation resource users are individuals with uniquely personal expectations, goals, and levels of recreational satisfaction, it was assumed for the purposes of impact analysis that recreational users within the MPA could be classified into specific user groups, each of which has its own set of recreational opportunities and expectations. It was also assumed that, because each user group has group-specific opportunities and expectations, each group also has specific recreational conditions and criteria that increase the likelihood for having satisfying user experiences. The user-group criteria described below were used in the impacts analysis of the proposed RMP management actions to determine the degree to which those actions would adversely or beneficially impact recreation users within the MPA. The descriptions, expectations, and criteria of these groups were derived from MFO resource specialist knowledge of visitor use of recreational resources and of what constitutes user group satisfaction, based on informal, but long-term, in-field interviews with visitors recreating throughout the MPA. For the action alternatives (Alternatives B, C, and D), the MFO's benefits-based recreation management goals and objectives (see Appendix F) for the proposed SRMAs were also used in analyzing the impacts of resource decisions on user groups and on the likelihood of those users having satisfying recreational experiences in these areas. The recreational user groups and assumed conditions/criteria for satisfactory recreational user experiences are as follows:
    - **Scenic drivers** – This group would include users of passenger cars and recreational vehicles (RVs) driving for pleasure while enjoying scenic attractions.

This user group generally prefers paved access to scenic vistas, cultural sites, and interpretive stations with turnoffs and/or temporary parking.

High traffic volumes, crowded parking areas, impacts to visual resources from paved viewpoints, and crowded developed campsites would adversely affect this user group.

- **Motorized (off-highway) drivers** – This group would include users of off-road motorcycles, all-terrain vehicles (ATVs) and 4-wheel drive vehicles.

  This group generally prefers a somewhat natural-appearing environment with non-paved surfaces ranging from graded, dirt roads to challenging routes with some evidence of human sights, sounds, and disturbances to remote, natural-appearing environments. The presence of other users and some presence of human-constructed structures are acceptable. The impacts of routes and facilities provided for group activities (including parking lots, route information, trailheads, and toilet facilities) are generally positive for this group.

  Overcrowding and overuse of trails, particularly by slower users such as hikers or mountain bikers, would have adverse impacts on this group's recreational experience.

- **Mountain bikers –**

  Mountain bike users generally prefer a relatively natural or natural-appearing environment with trails ranging from beginner to advanced. They also prefer an environment in which evidence of human disturbances, restrictions, and controls is present but not appearing to dominate the environment. Recreation facilities would be optional and ideally would blend in with the natural environment. Recreation management would encourage user dispersal. Preferred facilities include semi-primitive camping with basic facilities (parking lots, trailheads, and toilets).

  Overcrowded trails, noise (particularly from motorized users), dust/vehicle emissions, and poor trail etiquette by other users can have adverse impacts on this group's recreational experience.

- **Non-mechanized** users – This group would include hikers, backpackers, and equestrians.

  This group prefers a natural-appearing environment with little evidence of disturbance, few restrictions or visitor controls, no motorized users, and few mountain bike users. Dispersed use is preferred.

  Adverse recreational experiences include those listed for mountain bikers and also the high speeds of mechanized and motorized users. The speed and noise of motorized users is a particular concern to equestrian users.

- **River floating** users – This user group includes those recreating in boats, especially canoes, kayaks and rafts.

  The needs of this group are similar to those of the non-mechanized user group. They prefer a natural-appearing environment that shows little evidence of human disturbances

within the river corridor. Other than boat ramps and restroom facilities at the put-in and take-out locations and designated primitive campsites, needed facilities are few.

Overcrowding within river corridors and at campsites, noise, and impacts to river corridor scenic quality would detract from this group's user experience.

- **Specialized recreation** users –

  This group prefers locations that provide the conditions for specialized recreation. BASE jumpers generally prefer high cliffs with favorable wind conditions and safe landing zones. Rock climbers prefer a range of challenging routes in sufficient numbers so that crowding and waiting at routes are minimized. Competitive motorized and non-motorized trail users prefer challenging routes, often with enough distance and open area to allow for speed.

  Overcrowding within a given area may detract from the user or group experience for either BASE jumpers or rock climbers. Trail use conflicts with slower moving vehicles, people, or livestock would detract from the user experience for competitive motorized trail users.

- It was assumed that the designation of SRMAs and the management of recreation resources and activities within each SRMA under its specific management plan would allow the MFO to 1) protect, manage, and improve recreation resources, and 2) continue to manage the MPA for a broad range of recreational opportunities that meet recreational user expectations. In addition, areas not managed as SRMAs would lack protection for recreational opportunities from the impacts of increased visitation in the MPA, resulting in increasing resource user conflicts and intensifying recreation resource degradation (as indicated by recreational use trends for the MPA). These trends and impacts are discussed in Section 3.10.2.
- It was assumed that the management of recreation within the MPA through recreation focus areas would tend to concentrate specific recreational opportunities, activities, and users into spatially separate areas, thereby reducing conflicts among recreation resource uses. Focus areas are recreation management areas that promote specific recreational opportunities and activities while continuing to allow other recreational uses. It was assumed that a reduction in recreational use conflicts would enhance the recreational experiences within a particular focus area for certain user groups, because the focus area would be managed to meet the needs of specific user groups. It would do this by providing specific facilities and education to meet their needs (e.g., route marking, parking, campsites, and information), and thus the recreational experience would be more enjoyable and more likely to meet user recreation expectations.
- The National Visitor Use Monitoring Study, completed in the MPA in 2006, provides reliable data on user group participation. Visitors were asked what their "main activity" was while visiting Moab, and what activities they were participating in during their visit. The numbers in Table 4.67 show what activities visitors engage in as a percentage of use.

Table 4.67. Recreation Activity Participation

Activity	Percentage Participating	Percentage as the Main Activity	Number of Respondents as Main Activity
Hiking/Walking/Backpacking	53.3	18.9	220
Equestrian	1.2	0.9	3
Bicycling	17.9	13.5	118
Scenic driving	36.3	10.4	60
Viewing nature/Wildlife	96.9	9.7	89
OHV Use/Motorized Trail Use	11.5	6.0	59
Camping	22.6	2.8	26
Relaxing	42.4	3.8	24
Boating	6.9	3.9	27

4.3.10.1 Impacts Common to All Action Alternatives (B, C and D)

Proposed recreation prescriptions common to all action alternatives (Alternative B, C, and D) would

- Apply no surface occupancy (NSO) stipulations for oil and gas leasing within 0.5 miles of developed recreation sites, resulting in long-term, beneficial impacts on scenic drivers, mountain bikers, non-mechanized users, and some motorized users, because scenic values would be preserved in the immediate vicinity of the recreation site.
- Apply adaptive management to dispersed camping (limiting camping to designated sites where dispersed camping is causing resource damage). This would be beneficial to all users, because management would ensure that a range of camping opportunities would be maintained for all visitors to the MPA.
- Place the area of the current Colorado River SRMA within three SRMAs: the Two Rivers SRMA, the Colorado Riverway SRMA, and Dolores River Canyons SRMA to provide more focused management. This would be beneficial in the long-term for all recreation resource users, because the focus area concept would be applied to the SRMAs to reduce user conflicts, to maintain satisfying user recreational experiences, and to maintain opportunities for recreational benefits to users.

4.3.10.2 Alternatives Impacts

This analysis discusses 1) the impacts to recreational resources (e.g., vegetation, soils, and scenic quality), 2) the impacts to recreational opportunities for the user groups described above, and 3) the likelihood of resource use conflicts and meeting resource use expectations for resource user groups. Quantitative analysis of impacts was based on 1) the acreages of SRMAs and focus areas within the SRMAs, with the assumptions discussed above, and 2) the miles of designated travel routes within the SRMAs. These were used as indicators of resource user conflicts and the likelihood of satisfactory recreational experiences.

Woodland areas were dismissed from impacts analysis because the prescriptions for managing woodland harvesting areas and permits and for imposing limitations and/or prohibitions on fuelwood gathering in specified areas would have negligible impacts on recreational resources and opportunities.

4.3.10.2.1 Impacts of Air Quality Decisions on Recreation Resources

Air quality prescriptions common to all alternatives would have long-term, beneficial impacts on recreation. As noted in "Visual Resources" below (Section 4.3.10.2.17), an important component of recreation is scenic quality, so impacts that diminish or degrade scenic quality through the impacts of smoke, haze, or other air pollutants would have potentially adverse short-term or long-term impacts on the recreational opportunities that include scenic quality as part of the experience. All of the alternatives would mitigate the potential impacts from prescribed burns by timing prescribed burns to minimize potential impacts to air quality. Other air quality-mitigating prescriptions would include BLM-authorized activities that are managed to maintain and comply with air quality standards and meet PSD Class II standards and protect the Class I airsheds of Arches and Canyonlands National Parks. The common prescriptions would also comply with interagency MOUs regarding smoke management. Thus, the levels of smoke, haze, and other air pollutants produced within the MPA would be managed so as to not diminish or degrade scenic quality in the long term. These actions would be beneficial for all recreation user groups because it is assumed that high scenic quality is a recreational expectation for all visitors to the MPA.

4.3.10.2.2 Impacts of Cultural Resource Decisions on Recreation Resources

Current Federal laws and BLM policy promulgated to protect cultural resources would have impacts on recreation under all of the alternatives. Recreational activities would be limited for all recreational users in the short term in areas where site restoration, surveying, inventory, and interpretive activities would be conducted. Recreational opportunities and activities for all user groups would be limited or prohibited in the long term in or near known important cultural sites. Dispersed camping would be prohibited within or on sites eligible for listing on the NRHP, limiting recreational opportunities for all user groups in these areas. Eligible cultural resources would be protected, having long-term, beneficial impacts on all recreational user groups that include scenic/cultural resources as part of their recreational expectations. The Sego and Wall Street Rock Art Sites would be further developed as interpretive sites, which would be beneficial in the long term because of the expanded recreational opportunities to sightsee and to enjoy and understand regional cultural resources.

4.3.10.2.2.1 Alternative A

This alternative would continue current prescriptions for cultural resources, including allocation of sites to scientific use or discharge of sites from management. Current grazing management would continue. There would be no priorities set for 1) public interpretation sites, 2) cultural resource field inventories, 3) scientific restoration of damaged sites, or 4) nominations for listing on the NRHP. These prescriptions would have long-term, adverse impacts on recreation resources, because they would not provide the flexibility to manage the increasing number of visitors to the MPA and the corresponding demand for recreational opportunities. These

prescriptions would not manage the increasing number of motorized (OHV) users in the MPA and the associated surface disturbances created by these recreational activities in areas known to have high densities of cultural sites (see Sections 3.10.2.6 and 3.10.2.7.1 for a discussion of OHV-related resource use conflicts and impacts). Nor would these prescriptions provide protection from long-term, adverse impacts caused by livestock to recreation-related cultural resources (e.g., trampling sites and rubbing against rock art panels) (see Section 4.3.2.4.1).

The impacts of Alternative A on all user groups that seek opportunities for cultural resource exploration, viewing, and interpretive study would be adverse in the long term, because the lack of specific prescriptions to address these concerns would perpetuate current conditions, exacerbate recreation-related cultural resource degradation, and allow resource user conflicts to intensify, resulting in a diminishing likelihood of recreation resource users having satisfactory recreational/cultural interpretive experiences.

4.3.10.2.2.2 Alternative B

This alternative would set priorities for cultural resource field inventories, with 50,000 acres prioritized for surveying. Scientific restoration would be conducted to prevent further degradation of cultural resources, sites would be developed for public interpretation, identified areas would be managed for grazing exclusion, and enhanced protection of resources would be implemented through the development of National Register nominations of sites within the MPA. These cultural resource protection-related actions would identify, preserve, and restore these resources, with long-term, beneficial impacts on recreation, because cultural resource-related scenic quality and interpretive opportunities would be maintained and enhanced. All recreation user groups that seek opportunities for cultural resource exploration, viewing, and interpretive study would benefit in the long term. Compared to Alternative A, Alternative B would have more beneficial impacts to recreation resources and recreational/cultural opportunities, because its preservation and protection actions would enhance public enjoyment of the resource.

4.3.10.2.2.3 Alternative C

The impacts of this alternative on recreation resources and user groups would be similar to those discussed under Alternative B, though to a lesser degree, because cultural resource protection and preservation-related actions would be reduced in scope. A total of 30,000 acres would be prioritized for cultural surveys; there would be fewer grazing exclusion areas; fewer cultural sites would be targeted for scientific restoration; and fewer sites would be nominated for listing on the NRHP. Compared to Alternative A, Alternative C would be more beneficial for recreation for reasons similar to those discussed under Alternative B.

4.3.10.2.2.4 Alternative D

Alternative D would have impacts similar to those discussed under Alternative B, but to a lesser degree than under Alternatives B and C, because the protection and preservation-related actions for cultural resources would be less than under Alternatives B and C (with 20,000 acres prioritized for surveys, fewer areas with grazing exclusions, and fewer areas of scientific

restoration). Compared to Alternative A, Alternative D would be more beneficial for the same reasons discussed under Alternative B.

4.3.10.2.3 Impacts of Fire Decisions on Recreation Resources

All of the alternatives propose 5,000–10,000 acres/year for fuels reduction treatments, consistent with the 2005 Utah Plan for fire and fuels management (BLM 2005c). Prescriptions common to all of the alternatives would use fuels treatments, including prescribed fire, and chemical and mechanical treatments to restore ecosystems and to reduce hazards associated with fuel loading. Fire suppression would be a required consideration for all non-prescribed fires. The potential surface disturbances caused by these activities would have short-term impacts on recreational activities and recreation resources that could include the closing of recreational facilities and the loss of recreational opportunities within burned areas until the disturbed areas were adequately rehabilitated or restored. Scenic quality, as a component of recreational activities and experiences, would be degraded in the short-term in burned areas until vegetation re-growth. The long-term, beneficial impacts on recreation resources and opportunities would be produced for all user groups by the reduced risk or likelihood of naturally occurring and/or unplanned wildland fires within treated areas, and by the reduced risk of loss of remote and developed recreational areas and facilities from wildland fire. The improvement of wildlife habitat and enhancement of recreational opportunities for wildlife viewing and hunting in the long term by improving vegetation communities through fire management would be a long-term, beneficial impact to all user groups. It should be noted that fuels treatments to reduce the risk of wildland fire are similar to those used to improve vegetation communities and to improve or restore ecosystem health (see Section 4.3.10.2.16).

4.3.10.2.4 Impacts of Health and Human Safety Decisions on Recreation Resources

The impacts on recreation resources and user groups of health and safety prescriptions common to all alternatives (e.g., improving the physical safety around abandoned mine land [AML] sites and mitigation and/or remediation of AML hazards) would be negligible in the short term but potentially beneficial in the long term. Sites within the MPA that are known to contain environmental hazards and that are a direct threat to public safety are incompatible with recreation. Therefore, in the short term the remediation and/or reclamation of these areas would have no impacts on recreation, because these areas would be closed to all recreational activities anyway. In the long term, once the health and safety concerns were addressed, these sites would be considered for recreation management, which could provide additional recreational opportunities (particularly as interpretive AML sites) for all user groups.

4.3.10.2.5 Impacts of Land and Realty Decisions on Recreation Resources

Under prescriptions common to all of the alternatives, lands along the Colorado, Dolores, and Green Rivers (65,037 acres), along the Westwater (8,096 acres), and in the Black Ridge Wilderness area (5,200 acres) would continue to be withdrawn from mineral entry. The impacts to all recreation groups would be beneficial in both the short and the long term, because recreational opportunities and scenic quality would be preserved from locatable mineral surface

disturbances. River runners on the Colorado, Dolores, and Green Rivers would continue to enjoy high scenic-quality views along the undeveloped river corridors. Scenic drivers, hikers, and OHV users on travel routes and trails along the Colorado River would continue to have opportunities to experience the high scenic values along Routes 128 and 279, along hiking trails (e.g., Negro Bill, Fisher Towers), and on mountain biking and motorized OHV routes and trails within the riverway (e.g., Onion Creek, Wall Street, Poison Spider).

Under prescriptions common to the action alternatives, NSO mineral leasing stipulations would be applied to the withdrawn areas discussed above. This would increase the long-term, beneficial impacts to recreation by also protecting these areas from leasable and salable minerals exploration and development impacts and other potential surface disturbances. These areas would be avoidance areas for ROWs, providing long-term beneficial impacts to recreation users.

4.3.10.2.5.1 Alternative A

Under this alternative, there are no other specific prescriptions and impacts applicable to recreation, except for those discussed above under management common to all alternatives.

4.3.10.2.5.2 Alternatives B–D

Prescriptions and impacts applicable to recreation include those discussed above under actions common to all action alternatives. Compared to Alternative A, these alternatives would preserve more recreational resources and maintain more recreational opportunities for all resource user groups than would Alternative A, because, as discussed above, higher levels of protection from surface disturbances would be stipulated under the NSO leasing category.

4.3.10.2.6 Impacts of Livestock Grazing Decisions on Recreation Resources

The impacts on recreation of livestock grazing prescriptions common to all alternatives would be beneficial in the long term. Under all alternatives, approximately 48,220 acres within existing grazing allotments would be not be authorized for grazing, but would be used to benefit wildlife by reallocating forage for that purpose. This would enhance the recreational opportunities for all user groups for wildlife viewing, sightseeing, and hunting by improving wildlife habitat. The North Sand Flats, South Sand Flats and Between the Creek allotments are not available for grazing; this would benefit recreationists using the Sand Flats and Colorado Riverway SRMAs by eliminating livestock-people conflicts. Narrow strips along Utah Highway 128 (278,000 vehicles per year) and the Kane Creek Road (174,000 vehicles per year) would not be available for grazing, enhancing the safety of visitors

Under actions common to all action alternatives the 96,951-acre Hatch Point Allotment would be changed from sheep to cattle in order to benefit desert bighorn sheep and pronghorn, as these species are susceptible to diseases carried by domestic sheep. As discussed above, these actions would enhance the recreational opportunities for all recreation users by providing the opportunity to view wildlife.

4.3.10.2.6.1 Alternative A

Under this alternative the impacts of livestock grazing actions, through making grazing not available on an additional 78,612 acres (126,907 total acres), would benefit wildlife and have indirect, beneficial impacts on recreational opportunities for wildlife viewing and hunting, as discussed above. Cottonwood, Diamond, Bogart and Pear Park allotments are in prime big game hunting areas; making them not available for grazing would benefit wildlife and hunters/viewers of wildlife by increasing wild game numbers. Beaver Creek would not be available for grazing, enhancing backpacking opportunities in this perennial stream.

Grazing would be excluded within specified riparian areas but allowed in others, which would maintain beneficial, long-term, wildlife-related recreational opportunities for viewing within the protected areas. Grazing allotment vegetation treatments on approximately 67,125 acres to increase forage for wildlife and livestock would have short-term, adverse impacts on recreation but long-term, beneficial impacts to recreation resources and opportunities, as discussed above under Fire Management (Section 4.3.10.2.3).

4.3.10.2.6.2 Alternative B

Under this alternative, grazing could be made not available on an additional 105,497 acres (153,797 total acres). This would benefit wildlife and have indirect, beneficial impacts on recreational opportunities for wildlife viewing and hunting, as discussed above. Cottonwood, Diamond, Bogart and Pear Park allotments are in prime big game hunting areas; making them not available for grazing would benefit wildlife and hunters/viewers of wildlife by increasing wild game numbers. Beaver Creek would not be available for grazing, enhancing backpacking opportunities in this perennial stream. In addition, three allotments along Utah Highway 128 (Professor Valley, Ida Gulch and River) are in very high recreation use areas (over 278,000 vehicles/year); not making grazing available in these allotments would benefit visitors and their safety by reducing cattle-traffic conflicts. Mill Creek, an allotment in a popular hiking location, would not be available for grazing, benefiting visitors by allowing a more lush riparian area to be enjoyed.

In addition, 4,422 acres in riparian areas could be restricted using exclusion fences to protect vegetation and riparian areas in order to benefit wildlife. Vegetation treatments would be conducted on approximately 46,307 acres (69% of the acreage treated under Alternative A) to increase available forage for the benefit of wildlife. These actions would all have beneficial, indirect, and long-term impacts on recreation resources by improving wildlife habitat, thus enhancing the recreational opportunities for wildlife viewing and hunting for all recreational user groups. However, vegetation treatments would result in short-term, direct, adverse impacts on recreational resources and opportunities as discussed above under Fire Management. Compared to Alternative A, Alternative B would have similar impacts on recreation resources and opportunities but to a lesser degree, because fewer acres would be managed that would indirectly enhance opportunities for recreation-related wildlife viewing and hunting.

Closing a portion of Lower Gray Canyon to livestock grazing would also have long-term, beneficial impacts on recreation by creating the conditions and recreational opportunities for wildlife viewing. This decision would also improve the recreational experience for river runners

in Lower Gray Canyon by heightening the sense of naturalness and remoteness, allowing them to float the Green River without encountering cattle on the shore.

4.3.10.2.6.3 Alternative C

The beneficial impacts to recreation resources and opportunities under this alternative would be similar to those discussed under Alternative B (Alternative C would manage for the same acreage of vegetation treatments as Alternative B), but to a slightly less degree because fewer areas and restrictions would be placed on grazing (an additional 66,045 acres, or 114,234 total acres) as well as restricting 1,169 acres within riparian areas from grazing or 32% of the areas under Alternative B). The impacts of this alternative on recreation would be similar to Alternative B.

Cottonwood, Diamond, and Bogart allotments are in prime big game hunting areas; making them not available for grazing would benefit wildlife and hunters/viewers of wildlife by increasing wild game numbers. This beneficial impact on recreation users would not exist in Pear Park, which would be available for grazing. Beaver Creek would be available for grazing, detracting from backpacking opportunities in this perennial stream. In addition, three allotments along Utah Highway 128 (Professor Valley, Ida Gulch and River) are in very high recreation use areas (over 278,000 vehicles/year). The portions of these allotments along Utah 128 would not be available by constructing a fence along the road, thus benefiting visitors and their safety by reducing cattle-traffic conflicts. Mill Creek, an allotment in a popular hiking location, would not be available for grazing, benefiting visitors by allowing a more lush riparian area to be enjoyed.

4.3.10.2.6.4 Alternative D

Alternative D would have impacts similar to those discussed under Alternative B for vegetation treatments, because the number of treated acres would be the same. Grazing would be restricted on an additional 3,921 acres (52,214 total acres), and grazing management in riparian areas would continue current prescriptions, with impacts on recreation similar to those discussed under Alternative A.

Cottonwood, Pear Park, Diamond, and Bogart allotments are in prime big game hunting areas; making them available for grazing would adversely impact wildlife and hunters/viewers of wildlife by reducing wild game numbers. Beaver Creek would be available for grazing, detracting from backpacking opportunities in this perennial stream. In addition, three allotments along Utah Highway 128 (Professor Valley, Ida Gulch and River) are in very high recreation use areas (over 278,000 vehicles/year). These allotments would continue to be available for grazing, adversely impacting visitors and their safety by reducing cattle-traffic conflicts. Mill Creek, an allotment in a popular hiking location, would not be available for grazing, benefiting visitors by allowing a more lush riparian area to be enjoyed.

4.3.10.2.7 IMPACTS OF MINERALS DECISIONS ON RECREATION RESOURCES

Under all alternatives, the development projected on existing potash leases in the Ten Mile area could have adverse impacts on recreation users, because the surface-disturbing activities would potentially degrade scenic quality within this highly used recreation area.

Under all action alternatives, beneficial impacts through avoiding surface disturbance would result from the withdrawal of lands from locatable mineral entry along the Colorado, Green, and Dolores Rivers and from NSO stipulations imposed to protect these areas from the impacts of leasable minerals development. No surface disturbing activities, including the disposal of salable minerals, would be allowed within this area. NSO stipulations would also be applied to those areas where minerals development would unreasonably conflict with important natural resource values (see Appendix C for a list of these areas). The application of NSO stipulations in these areas would indirectly benefit recreation through preservation and protection of natural resources, including scenic quality, as surface disturbing activities would be precluded.

Table 4.68 below shows the proposed MPA acreages that would be open to minerals development by alternatives for leasable, locatable and salable minerals, and also shows the 15-year RFD surface disturbances for fluid minerals (oil and gas) and geophysical exploration.

Table 4.68. Acres Open to Minerals Development and Projected Acres of Surface Disturbance (RFD) Associated with Oil and Gas Development, by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Standard and Timing and Controlled Surface Use (% of MPA)	1,427,949	808,096	1,234,267	1,387,473
Locatable Minerals	1,389,531 (353,510 open under WSA IMP)	1,389,531 (353,510 open under WSA IMP)	1,389,531 (353,510 open under WSA IMP)	1,389,531 (353,510 open under WSA IMP)
Salable Minerals	1,467,768	808,097	1,234,267	1,387,473
Surface Disturbance from Oil and Gas Development (% of MPA)	6,772 (0.4%)	3,823 (0.2%)	6,483 (0.4%)	6,739 (0.4%)
RFD Geophysical	2,397	1,404	2,072	2,329

Although the impacts of mineral development on recreation are discussed below throughout the MPA, it is important to note that recreation use does not occur equally within the MPA. It is estimated that recreation use occurs with regularity on 976,173 acres of the MPA (53% of the MPA). High use recreation areas are those that are proposed as SRMAs in one or more alternatives. Recreation use is generally highest in areas closer to the City of Moab. The impacts of minerals development on recreation are higher in areas receiving high recreation use, and lower in areas receiving less recreation use. The majority of impacts upon recreation users from mineral development would remain whether or not the area is managed as an SRMA, because SRMAs, for the most part, do not restrict mineral development. Since the projected levels of

mineral development are not likely to impact current levels of recreation use, this use would most likely continue to occur (or increase) regardless of management direction.

4.3.10.2.7.1 Alternative A

The MPA acres open to leasable, salable, and locatable minerals development would be subject to surface disturbances that would potentially have direct, short-term, and long-term adverse impacts on recreational opportunities and experiences, because natural resources, including scenic quality could be affected. While all minerals surface disturbances and activities would be required to comply with the impact area's VRM class objectives, adverse impacts would be caused by the following: ground-surface disturbances during the cross-country seismic exploration for fluid minerals (i.e., geophysical exploration disturbances); construction of oil and gas wells and pads, access roads, and pipelines that would potentially intrude upon recreational areas; and noise associated with wells, gas compressor stations, and other infrastructure construction, maintenance, and operation. The development associated with locatable minerals (e.g., copper, vanadium, uranium, placer gold) would also create surface disturbances that would potentially impact recreation resources. Night lighting of oil and gas wells and facilities would also degrade scenic quality related to recreational opportunities and recreational expectations. Indirect, adverse impacts to recreation resources and opportunities would include 1) soil erosion from surface disturbances, 2) the potential creation of mine tailings piles during locatable mining, 3) potential air quality degradation from hydrocarbon releases during natural gas flaring, and 4) visual quality degradation from fugitive dust.

The majority of the oil and gas wells would be located within the Book Cliffs (104 wells), Greater Cisco (196 wells), Big Flat-Hatch Point (46 wells), and Lisbon Valley (56 wells) RFD areas. Based on the expected level of oil and gas development within the MPA, the impacts to recreation would be adverse in the short and long term from the potential surface disturbance impacts to scenic quality and recreation resources, as discussed above.

Under this alternative, geophysical RFD surface disturbances are estimated to affect approximately 0.1% of the MPA during the life of the RMP, with similar potential, long-term, adverse impacts to scenic quality because exploration activities could be permitted to travel cross-country off designated routes.

Leasable minerals other than oil and gas (e.g., potash, and salt) as well as locatable and salable minerals are estimated under RFD projections to have a total disturbance of approximately 1,015 acres (0.01% of the MPA) during the life of the RMP. The impacts to recreation resources would be adverse but minor, because of the relatively small area of potential surface disturbance.

4.3.10.2.7.2 Alternative B

The impacts of minerals development would be similar to but lesser than those discussed under Alternative A, because some types of activities would occur, the RFD prediction for oil and gas under this alternative would be approximately 56% of the level of disturbance expected under Alternative A, so these impacts would occur across less area. The majority of the oil and gas

wells would be located within the Book Cliffs (64 wells), Greater Cisco (85 wells), Eastern Paradox (21 wells), and Lisbon Valley (54 wells) RFD areas.

The geophysical exploration impacts are estimated to affect approximately 1,404 acres of the MPA (58% of the acreage affected under Alternative A), with impacts similar to those discussed under Alternative A. Impacts to recreation from leasable minerals other than oil and gas and from locatable and salable minerals would be similar to those under Alternative A, because the predicted number of impacted acreage would be the same as in Alternative A.

Compared to Alternative A, Alternative B would have similar impacts, but to a lesser degree because fewer acres within the MPA would be potentially impacted by minerals exploration and development.

4.3.10.2.7.3 Alternative C

The impacts of minerals development on recreation would be similar to those under Alternative A because the same types of activities would occur, and the RFD for oil and gas under Alternative C predicts a level of disturbance approximately 96% of that predicted under Alternative A. The majority of the oil and natural gas wells would be located within the Book Cliffs (104 wells), Greater Cisco (197 wells), Big Flat-Hatch Point (34 wells), and Lisbon Valley (56 wells) RFD areas. The RFD surface-disturbance acreages of leasable minerals other than oil and gas, locatable minerals, and salable minerals (e.g., sand and gravel, clay, building stone) would be the same as Alternative A. The estimated surface disturbances from geophysical exploration within the MPA would be 86% of the area estimated to be disturbed under Alternative A. Thus, the impacts to recreation under Alternative C would be similar to those discussed under Alternative A, because the estimated acreages of disturbance are similar.

4.3.10.2.7.4 Alternative D

The minerals impacts to recreation under Alternative D would be similar to those under Alternative A, because the RFD estimate of oil and gas development would be 99% of that under Alternative A, and because approximately 80% of the area proposed under Alternative A would be open to locatable mineral disposal. The majority of the RFD-predicted oil and natural gas wells would be located within the same RFD areas as discussed under Alternative A. The impacts on recreation from leasable minerals other than oil and gas, locatable minerals, and salable minerals, and from geophysical exploration would be similar to those discussed under Alternative A, because the predicted acreages and locations of impacts would be the same or similar to that of Alternative A.

4.3.10.2.8 Impacts of Non-WSA Lands with Wilderness Characteristics Decisions on Recreation Resources

4.3.10.2.8.1 Alternative A

Under Alternative A, no specific prescriptions for non-WSA areas with wilderness characteristics were proposed. Thus, they would not be managed to retain those characteristics.

In addition, Alternative A proposes management of large areas of land for cross country OHV use. This would adversely reduce the non-motorized recreational opportunities and degrade recreation resources in the long term for non-mechanized and other resource users that seek remote, primitive camping and hiking where solitude and natural landscapes are preferred.

4.3.10.2.8.2 Alternative B

Under this alternative, approximately 266,485 acres would be managed to maintain areas with wilderness characteristics in non-WSA lands, with vehicle use limited to designated routes and the preclusion of surface disturbing activities. This would have beneficial, long-term impacts on recreational resources and on motorized and non-mechanized recreational opportunities because the recreational opportunities for remote OHV use along designated routes, and primitive camping and hiking where naturalness and solitude are the preferred recreational experiences, would be maintained. Compared to Alternative A, this alternative would benefit some types of recreation because remote, wilderness-related non-motorized travel, camping, and hiking opportunities and recreational resources would be preserved.

All of 21 and portions of 7 non-WSA lands with wilderness characteristics would fall within 8 designated SRMAs. These SRMAs would focus recreation opportunities on primitive recreation and solitude. This would preclude new mechanized route construction and limit or restrict motorized special recreation events, as well as cross country motorized use.

4.3.10.2.8.3 Alternative C

Alternative C would have similar impacts as Alternative B, but to a much lesser degree, because the prescriptions that affect recreation would be similar and 47,761 acres (or 20% of the area managed for wilderness under Alternative B) would be maintained for areas with or likely to possess wilderness characteristics. Compared to Alternative A, this alternative would be more beneficial because remote, wilderness-related travel, camping, and hiking opportunities and recreational resources would be preserved, although to a lesser degree than Alternative B.

Beaver Cree, non-WSA lands with wilderness characteristics would fall within the Dolores River Canyons SRMA. Fisher Towers and Mary Jane Canyon would fall within the Colorado Riverway SRMA. SRMAs would focus recreation opportunities on primitive recreation and solitude. This would preclude new motorized route construction and limit or restrict motorized special recreation events, as well as cross country motorized use.

4.3.10.2.8.4 Alternative D

This alternative would have impacts similar to Alternative A because the prescriptions would be the same (no lands would be managed for non-WSA wilderness characteristics protection). However, since OHV use in Alternative D is largely managed as Limited to Designated Routes, adverse impacts on those resource users seeking remote areas would be lessened as compared with Alternative A.

4.3.10.2.9 Impacts of Paleontology Decisions on Recreation Resources

4.3.10.2.9.1 Alternative A

Beyond established BLM policy, there are no specified paleontological prescriptions that would impact recreational resources and user groups under Alternative A. Except where specifically prohibited, fossil collection is an acceptable recreational activity on BLM-administered public lands, and recreational collectors are allowed to collect and retain reasonable quantities of common invertebrates and plant fossils for personal, non-commercial use.

4.3.10.2.9.2 Alternatives B–D

Under actions common to all action alternatives, paleontological resources would be protected within the Dinosaur Diamond Prehistoric Byway; recreation-related fossil collection would be prohibited within the Colorado Riverway SRMA; and fossil collection would be prohibited near high-use areas (but allowed in other non-high-use areas) of the Labyrinth Rims/Gemini Bridges SRMA. The impacts on paleontology-related recreation resources would be the long-term preservation and protection of paleontological resources and values in areas where the resource is vulnerable to depletion. The preservation of recreational opportunities to enjoy and appreciate this limited resource in high-use recreation areas would have long-term, beneficial impacts on all recreational user groups, who enjoy viewing paleontological resources. Compared to Alternative A, the action alternatives would be more beneficial to recreational resources and recreational opportunities, because they would provide greater protection to paleontological resource values within high-use areas of the existing and proposed SRMAs and Scenic Byways, and because recreational viewing and interpretive opportunities of paleontological resources would be maintained.

4.3.10.2.10 Impacts of Recreation Decisions on Recreation Resources

A summary of the recreation management actions by alternative is shown below in Table 4.69. An analysis of the impacts of the proposed recreation prescriptions follows the table.

Table 4.69. Summary of SRMA Recreation Analysis Data by Alternative

SRMA	Alternative A	Alternative B	Alternative C	Alternative D
Book Cliffs				
SRMA Acres (non-motorized focus)	None	348,140	None	None
Designated Routes in SRMA (miles of D-Class Roads)	N/A	18	N/A	N/A
Cameo Cliffs				
SRMA Acres	15,580	15,597	15,597	15,597
Designated Routes in SRMA (miles of D Roads)	62	61	61	61

Table 4.69. Summary of SRMA Recreation Analysis Data by Alternative

SRMA	Alternative A	Alternative B	Alternative C	Alternative D
Canyon Rims				
SRMA Acres	101,531	101,531	101,531	101,531
Designated Routes in SRMA (miles of D Roads)	291	222	276	289
Non-Mechanized Focus Area (acres)	N/A	3,642	3,642	N/A
Colorado Riverway				
SRMA Acres	17,983	103,467	89,936	79,126
Designated Routes in SRMA (miles of D Roads)	45	84	77	66
Non-Mechanized Focus Area (acres)	N/A	37,277	33,451	1,287
Specialized Non-motorized Focus Area (acres)	N/A	N/A	42	42
Scenic Driving Focus Areas (corridor width)	N/A	1-mile width	1/2-mile width	1/4-mile width
Boating – Commercial	30 commercial outfitters permitted	19 Unallocated, 2 Allocated Permits (100 user-days each)	21 Unallocated Permits	25 Unallocated Permits
Dolores River				
SRMA Acres	N/A	31,661	31,661	N/A
Designated Routes in SRMA (miles of D Roads)	N/A	14	30	N/A
Labyrinth Rims/Gemini Bridges				
SRMA Acres	N/A	300,650	300,650	60,939 (Dee Pass SRMA only)
Designated Routes in SRMA (miles of D Roads and motorized single track)	N/A	813	881 D road; 94 single track	140 D road; 83 single track
Non-Mechanized Focus Area (acres)	N/A	26,031	13,383	N/A
Mountain Bike Backcountry Touring Focus Area (acres)	N/A	17,530	23,702	N/A
Motorized Backcountry Touring Focus Area (acres)	N/A	N/A	16,299	N/A

Table 4.69. Summary of SRMA Recreation Analysis Data by Alternative

SRMA	Alternative A	Alternative B	Alternative C	Alternative D
Scenic Driving Focus Areas (corridor width)	N/A	1-mile width	1/2-mile width	1/4-mile width
Specialized Non-Motorized Focus Area (acres)	N/A	N/A	928	N/A
Specialized Motorized Focus Area acres	N/A	N/A	35,575	57,875
Open OHV Focus Area (acres)	N/A	N/A	1,866	3,064
Lower Gray Canyon				
SRMA Acres	N/A	3,759	3,759	N/A
Designated Routes in SRMA (miles of D Roads)	N/A	0	0	N/A
Boating	35,000 passenger-days/year; limit of 6 groups/day with group limits of up to 25 persons.	35,000 passenger-days/year; limit of 6 groups/day with group limits of up to 25 persons.	35,000 passenger-days/year; limit of 6 groups/day with group limits of up to 25 persons.	35,000 passenger-days/year; limit of 6 groups/day with group limits of up to 25 persons.
Sand Flats				
SRMA Acres	N/A	6,246	6,246	6,246
Designated Routes in SRMA (miles of D Roads)	N/A	20	23	25
South Moab				
SRMA Acres	N/A	63,999	63,999	N/A
Designated Routes in SRMA (miles of D Roads)	N/A	137	164	N/A
Non-Mechanized Focus Area (acres)	N/A	34,486	34,486	N/A
Mountain bike Backcountry Touring Focus Area (acres)	N/A	2,255	2,255	N/A
Scenic Driving Focus Areas (corridor width)	N/A	1-mile width	1/2-mile width	NA
Specialized Non-Motorized Focus Area (acres)	N/A	2,905	2,905	N/A
Specialized Motorized Focus Area (acres)	N/A	N/A	41	N/A

Table 4.69. Summary of SRMA Recreation Analysis Data by Alternative

SRMA	Alternative A	Alternative B	Alternative C	Alternative D
Two Rivers				
SRMA Acres	N/A	29,839	29,839	14,056
Designated Routes in SRMA (miles of D Roads)	N/A	5	12	18
Boating Management				
Westwater Canyon	30 commercial outfitters permitted. Maximum 24,000 passenger-days/year.	Daily launch limit of 48 people for each sector. Maximum group size of 16 (including guides on commercial trips).	Commercial and private permits required. Daily launch limit of 75 people. Maximum commercial trip size of 25 passengers plus one guide/craft and two additional crew members. Permit 18 commercial outfitters. Use levels distributed equally between commercial and private use.	Maximum group size of 32 (including guides on commercial trips). Daily launch limit of 128 people for each sector (commercial and private).
Cisco Landing to Dewey Bridge		No restrictions on private use. 20 unallocated and 2 allocated (100 users/day each) permits for commercial use.	No restrictions on private use. 22 unallocated permits for commercial use.	25 unallocated permits for commercial use.
Dolores River to Colorado River Confluence		Bridge Canyon to Dolores/Colorado River confluence–Maximum group size of 16 (including guides on commercial trips).	Bridge Canyon to Dolores/Colorado River confluence–Commercial and private permits required. Maximum group size of 25 (including guides on commercial trips). No daily launch limits. Permit 14 unallocated commercial outfitters.	Colorado State Line to Colorado River confluence–Maximum group size of 32 (including guides on commercial trips).
Non-Mechanized Focus Area (acres)	N/A	23,479	23,479	N/A

Table 4.69. Summary of SRMA Recreation Analysis Data by Alternative

SRMA	Alternative A	Alternative B	Alternative C	Alternative D
Utah Rims				
SRMA Acres	N/A	15,424	15,424	N/A
Designated routes (miles of D roads and single track routes)	N/A	28	28 D road;34 single track	N/A

4.3.10.2.10.1 Book Cliffs SRMA

Alternative A

Under Alternative A the Book Cliffs would not be designated as a SRMA; instead, the area would continue to be managed for general recreational use and impacted by conditions that currently affect the area. As discussed in Section 3.10.1.2.12, the Book Cliffs area is remote, containing five WSAs whose natural, undeveloped settings would be maintained. It is not heavily used for recreation nor do recreational trends indicate an increasing use of the area. Conflicts between user groups would be minor because of its light use, remoteness, and size. Thus, the impacts on recreation resources and users would be minor.

Alternative B

Under Alternative B, the 348,140-acre Book Cliffs Undeveloped SRMA would be established as a focus area for non-mechanized recreational opportunities. Prescriptions would focus on promoting low-frequency visitor use and limiting OHV travel to 18 miles of designated routes, resulting in long-term, beneficial, protection-related impacts on recreation resources by limiting surface disturbances within the SRMA. Non-mechanized users would benefit in the long term from the focus on opportunities for remoteness, solitude, and naturalness, and from the reduced likelihood of recreational resource use conflicts with mountain biking or motorized users. Other user groups (e.g., motorized OHV users and mountain bikers), while limited to the designated OHV routes, would benefit in the long term from opportunities to access and recreate in the SRMA. Under this alternative, the long-term outcome of reducing resource use conflicts and increasing the likelihood of having satisfying recreational experiences in a remote setting would have individual benefits that include improvements in outdoor skills and knowledge, improved outdoor-recreation self-confidence, and a greater sense of closeness with the natural world.

Compared to Alternative A, Alternative B would have greater beneficial impacts on recreation, because recreational resources would receive more protection from surface disturbances and because the potential for resource use conflicts between non-mechanized and mechanized user groups would be reduced. However, managing for non-mechanized use would adversely impose greater limits on recreational opportunities for other recreational user groups than the limits under Alternative A.

Alternatives C and D

Because the Book Cliffs SRMA would not be established under these alternatives and, therefore, additional prescriptions would not be proposed, the impacts of Alternatives C and D on recreation resources and resource user groups would be similar to those discussed under Alternative A.

4.3.10.2.10.2 Cameo Cliffs SRMA

Alternative A

Under Alternative A, the 15,597-acre Cameo Cliffs SRMA would be managed as a focus area for OHV (motorized) trail use, with use limited to designated trails. The impacts on recreation resources would be minor in the long term, because the area is currently managed for OHV motorized trail use with surface disturbances limited to designated routes. Management that promotes this kind of activity would result in long-term beneficial impacts on motorized and specialized-motorized users.

Alternatives B–D

Under the action alternatives, Cameo Cliffs would be managed as a 15,597-acre SRMA, providing recreational opportunities for motorized and mountain biking use on designated trails, and non-mechanized hiking and equestrian opportunities. The SRMA would not be managed with user focus areas. Specific management goals would include providing opportunities for 1) ATV and other OHV motorized use on old mining exploration roads, 2) horseback riding on the Old Spanish Trail, and 3) hiking in Hook and Ladder Gulch. Prescriptions would include coordination with San Juan County to implement an ATV plan and protection of scenic, cultural, wildlife, and vegetation resources. Under this alternative, camping restrictions would be imposed as needed, and an OHV trailhead facility would be constructed. The impacts on recreation resources would be beneficial in the long term, because prescriptions would protect recreation resource values. The impacts on non-mechanized, OHV (motorized), and mountain biking user groups would also be beneficial in the long term, because 1) recreational opportunities would be enhanced and expanded by the construction of SRMA recreational facilities and the development of mountain biking and non-mechanized routes, and 2) the proposed ATV plan would reduce the potential for user conflicts between motorized users, mountain bikers, and non-mechanized users. The anticipated long-term, benefits-based management outcome for this area would include an increased sense of adventure, an appreciation for the region's history, and increased local, tourist-related revenue.

Compared to Alternative A, the impacts to recreation under these alternatives would be more beneficial in the long term, because prescriptions would 1) provide more recreational opportunities for mountain biking and non-mechanized forms of recreation, 2) provide additional facilities for users; and 3) protect and maintain recreation resource values within the SRMA through RMP prescriptions and coordination with San Juan County.

4.3.10.2.10.3 Canyon Rims SRMA

Alternative A

Under Alternative A, the current 101,531-acre SRMA would maintain recreational opportunities for scenic driver, motorized OHV, mountain biking, specialized, and non-mechanized user groups. Also, the Hatch Wash and the lower section of West Coyote Creek would be managed for primitive, non-motorized recreation. The SRMA would be 1) open to mineral leasing under controlled surface-use stipulations except for developed recreational sites that would be managed as open with NSO stipulations; 2) managed for OHV use limited to existing routes but restricting motorized events and special events to the existing Jeep Safari route; 3) designated as VRM Class III except for VRM Class II designation of western rim lands at Hatch Point; 4) managed to improve developed recreation sites and to restrict camping near developed recreation areas; and 5) closed to woodcutting and gathering.

Prescriptions 1 and 3 would have long-term, direct, adverse impacts on recreation resources by permitting potential mineral leasing activities within the eastern portion of the SRMA that would degrade scenic quality. Managing the SRMA under prescriptions 2, 4, and 5 would reduce surface disturbances and have long-term, beneficial impacts on recreation resources by preserving and/or protecting recreation-related scenic quality.

As the number of visitors to the SRMA increases and levels of recreational activity and demand also increase, there is the likelihood for increased recreational resource user conflicts between motorized and non-motorized user groups, with subsequently diminishing opportunities for satisfactory recreational experiences. As discussed in Section 3.10.2.6, the potential for displacement of non-mechanized users would likely increase as motorized OHV use increases along existing travel routes.

Alternative B

Alternative B would have the same prescriptions as Alternative A except that: 1) a 3,642-acre, non-mechanized focus area would be managed at Hatch Wash, and 2) two scenic driving corridor focus areas would be designated along the Needles and Anticline Roads (with widths of one mile or to the border of the adjoining focus area). The Windwhistle Nature Trail, Anticline Trail, Needles Trail, and Trough Springs Canyon Trail would be designated for non-mechanized (hiking) use only. The SRMA management goals would be to 1) provide scenic driving opportunities along the scenic byway and along the backcountry road system, 2) provide scenic overlook facilities to enhance the visitor experience, 3) provide quality camping in developed campgrounds, and 4) provide hiking and backpacking opportunities. The long-term impacts to recreational users under this alternative would be a reduced likelihood of resource use conflicts and an increased likelihood of satisfying experiences for scenic driver and non-mechanized user groups within the SRMA, because of the management of focus areas that would emphasize activity areas and opportunities for each group. The beneficial impacts on recreational opportunities under this alternative would increase the likelihood that the benefits-based, targeted, recreational outcomes for the area would be achieved; these outcomes include 1) opportunities to escape from crowds to enjoy and appreciate nature; 2) easy access to natural landscapes for exercise and an improved capacity for outdoor physical activity; 3) increased

tourism revenues; and 4) greater family bonding through a shared experience of the natural landscape. Compared to Alternative A, this alternative would have more beneficial impacts on recreational opportunities and experiences, because the potential for resource use conflicts would be reduced. However, the potential for degradation of scenic quality from minerals development would be similar to that under Alternative A.

Alternative C

Under Alternative C, prescriptions would be the similar to those under Alternative B, except that the width of the proposed Needles and Anticline Roads scenic driving corridors would be 1/2 mile (or to the border of the adjoining focus area), which would reduce the beneficial impacts to the scenic quality viewing experience within the scenic driving corridors by decreasing the width of the protected viewshed. The impacts on recreation resources under this alternative would be similar to those discussed under Alternative B, because the prescriptions are similar.

Alternative D

Alternative D prescriptions would be similar to those under Alternative B, except that the width of the proposed Needles and Anticline Roads scenic driving corridors would be 1/4 mile (or to the border of the adjoining focus area), and there would be no management of a non-mechanized user focus area. While the Windwhistle Nature Trail, Anticline Trail, Needles Trail, and Trough Springs Canyon Trail would be designated for non-mechanized (hiking) use only under this alternative, the lack of a 3,642-acre, non-mechanized recreation focus area would maintain conditions for resource use conflicts between non-mechanized, mountain biking, and motorized resource user groups, as discussed under Alternative A. Managing the scenic driving corridors at 1/4 mile width would have similar beneficial impacts as discussed under Alternative B, but to a lesser degree, because the reduced width of the protected viewshed corridor would reduce the scenic quality of the viewing experience. Compared to Alternative A, opportunities for scenic driving users and hikers would be more beneficially enhanced by designation of scenic driving corridors and hiking-only trails; however, the impacts on other recreation resources and user groups under this alternative would be similar to those discussed under Alternative A, because the prescriptions would be similar.

4.3.10.2.10.4 Colorado Riverway SRMA

Alternative A

Prescriptions under Alternative A for the existing 17,983-acre Colorado Riverway SRMA would include actions authorized under the current Colorado Riverway Plan that are focused on improving and constructing sites and facilities along the riverway to enhance the range of recreational opportunities, and to protect its scenic quality and other resource values. Prescriptions under this alternative would 1) include acquiring scenic easements on state and private lands, 2) restrict motorized and mountain biking travel to designated routes, 3) limit camping and campfires to designated sites, 4) close the area to woodcutting and limit wood gathering. The Colorado River shoreline within the Riverway is currently withdrawn from mineral entry. The Riverway plan would limit Fisher Towers, Negro Bill Canyon, Hunter Canyon, and Corona Arch trails to non-mechanized (hiking) use only. Recreational boating

management within the Riverway (including the Colorado and Dolores Rivers) would continue as under current prescriptions, allowing 30 commercial operators and 24,000 passenger-days per year.

Under this alternative, improving recreational facilities, maintaining the separation of recreational user groups and limiting surface disturbances would result in managing the SRMA to provide for satisfactory recreation opportunities and experiences by limiting user conflicts and maintaining the visual and resource setting.

Alternative B

Alternative B would establish the Colorado Riverway SRMA as a Destination SRMA and would expand its boundary to 103,467 acres under the same prescriptions as discussed under Alternative A. The SRMA would be managed to provide opportunities for scenic driving, quality camping experiences in the developed campgrounds, river floating, hiking, and horseback riding. Camping would be prohibited on the north side of the river along Highway 128 and in the Kane Creek Crossing area. Boating activities would be managed to provide recreational opportunities for scenic whitewater river running. No focus area would be managed for specialized recreation activities, but 37,277 acres would be managed as non-mechanized focus areas in Negro Bill Canyon and the Richardson Amphitheater/Castle Rock area. Prescriptions would manage one-mile-wide scenic driving focus areas along Highways 128 and 279 and along portions of the Lockhart Basin Scenic Byway and portions of the LaSal Mountain Loop Road. The prescriptions under this alternative would have long-term, beneficial impacts on recreation resources by 1) proposing an increased recreational area and additional recreational facilities for camping, information and education, trails and trail access, and sanitation; 2) managing focus areas for non-mechanized and scenic driving user groups; and 3) restricting camping to designated areas. The actions would have beneficial impacts on non-mechanized and scenic driving recreation because they would increase opportunities while reducing the potential for recreational user conflicts within the SRMA and would reduce or eliminate the adverse impacts currently caused by unmanaged camping within the SRMA (see Section 3.10.1.2.1). However, Alternative B would have no long term beneficial impacts on BASE jumping and rock climbing opportunities, because no specialized focus area would be established in the Kane Creek and Wall Street areas. River floating users would be adversely impacted in the long term by the elimination of camping opportunities along the north side of the Colorado River. The overall potential outcome would be a greater likelihood that the area's benefits-based, targeted outcomes would be achieved; these outcomes include increased tourism revenue and individual benefits such as an improved appreciation of nature's splendor, a greater sense of adventure, an enhanced awareness and understanding of nature, and improved outdoor skills.

When compared to Alternative A, Alternative B would be more beneficial, because it would 1) increase the size of the SRMA by 85,484 acres 2) expand recreational opportunities for all user groups; 3) further reduce the potential for resource-use conflicts through recreation focus areas; 4) further improve the likelihood of satisfactory recreational experience for all recreational resource users by proposing to construct or permit more recreational facilities within the SRMA; 5) eliminate potential resource degradation caused by unmanaged, boating-related shoreline camping within the SRMA; and 6) designate more miles of OHV routes (84 miles under Alternative B compared to 45 miles under Alternative A).

Alternative C

Alternative C would establish the Colorado Riverway SRMA as an 89,936-acre Destination SRMA under the same prescriptions as discussed under Alternative A. The SRMA would be managed with prescriptions similar to those discussed under Alternative B, except that 1) the north shore of the Colorado River would be open to undeveloped camping and hiking opportunities (with prescriptions to protect wildlife habitat and other resource values); 2) the Kane Creek Crossing area would be open to designated camping; 3) two more facilities would be proposed than under Alternative B; 4) the focus areas for non-mechanized recreation would be managed on 33,451 acres in the same areas as Alternative B; 5) scenic driving focus areas would be managed along the same corridors as in Alternative B but with a 1/2-mile protected viewshed width; and 6) focus areas for specialized, non-motorized activities (e.g., BASE jumping and rock climbing) would be managed. The impacts on recreation would be similar to those discussed under Alternative B, except that there would be more beneficial impacts to non-mechanized and motorized OHV user groups from increased opportunities for camping, hiking, touring, and specialized recreation. The beneficial impacts to scenic drivers would be similar to those under Alternative B but reduced, because of the narrower corridors of protected viewsheds.

Compared to Alternative A, this alternative would be more beneficial for reasons similar to those discussed under Alternative B. The SRMA would be increased in size by 71,953 acres as compared to Alternative A; it would be managed for focus areas that would reduce user conflicts; and it would have an increase of 32 miles in the number of miles designated for OHV travel routes.

Alternative D

Alternative D would establish the Colorado Riverway SRMA as a 79,126-acre SRMA, with prescriptions similar to those in Alternative C except that 1) four fewer camping sites and facilities would be designated or proposed; 2) the non-mechanized focus area in Negro Bill Canyon would be reduced from 8,684 acres to 1,287 acres, and there would be no management of a non-mechanized focus area within the Richardson Amphitheater/Castle Rock area; and 3) the scenic driving corridors would have protected viewshed widths of 1/4 mile. This alternative would have long-term beneficial impacts on recreational resources and uses similar to those described for Alternative C, but to a lesser degree than Alternative C, because fewer recreational opportunities would be available within the smaller (and fewer) focus areas. There would be a greater likelihood for long-term adverse impacts from recreation user group conflicts between non-mechanized, specialized, mountain biking, and motorized users in the Richardson Amphitheater/Castle Rock area, because a focus area would not be established to manage the diversity and intensity of recreational use in this highly popular area (see Section 3.10.1.2.1). The reduction in size of the Negro Bill Canyon focus area under this alternative, when compared to the other action alternatives (an 11,223-acre reduction compared to Alternative B; a 7,397-acre reduction compared to Alternative C), would increase the likelihood for resource use conflicts in the SRMA. This alternative would not propose camping sites at Entrada Bluffs, Hittle Bottom, and Kane Creek Crossing, nor would it propose constructing sanitary facilities at the Wall Street climbing area, which would adversely diminish the recreational experience of recreation users in the long-term by not managing the proposed SRMA to meet the current or projected future need and demand for these facilities (see Section 3.10.2.5).

Compared to Alternative A, this alternative would be more beneficial in the long-term for recreation resources and users for reasons as discussed under Alternative C, because the prescriptions are similar. Under Alternative D, the SRMA would be beneficially increased in size by 61,143 acres (a four-fold increase in area over Alternative A) with 21 more miles of designated OHV routes. These increases would provide more managed recreational opportunities for all resource users than would Alternative A.

4.3.10.2.10.5 Dolores River Canyons SRMA

Alternative A

Under this alternative, a portion of the Dolores River Canyons area would be managed for general recreational use under the current Colorado Riverway management plan. The potential impacts of this alternative on recreational resources in the Dolores River Canyons area would be adverse in the long-term, because no specific recreation management prescriptions or programs are proposed for this area, except for the current boating management limits discussed above under the Colorado River SRMA for Alternative A. The lack of specific recreation management prescriptions for this area would increase the likelihood of long-term degradation of recreation resources from lack of intensive management of shoreline use (e.g., overnight camping, campfires, and unrestricted wood gathering).

Alternative B

This alternative would manage the Dolores River Canyons as a 31,661-acre Undeveloped SRMA, separate from the proposed Colorado Riverway SRMA. Prescriptions for the Dolores River Canyons SRMA would prohibit motorized and mountain biking recreation within the Dolores River tributary canyons, consistent with the proposed Moab Travel Plan. The SRMA would be managed for recreational opportunities that include non-motorized boating, backpacking, and day hiking, with facilities that support primitive, non-motorized use of the SRMA. There would be no focus area management within the SRMA.

The prescriptions under this alternative would have beneficial impacts on recreational resources, as well as on river floating and non-mechanized resource user groups, because boating group size limits would be imposed to ensure high-quality boating opportunities with an emphasis on primitive, non-motorized uses. There would be adverse impacts on motorized and mountain biking user groups, because no new motorized routes would be proposed within the SRMA, and OHV opportunities would be limited to 14 miles of designated routes. Beneficial, long-term impacts would include a reduction in potential recreational resource use conflicts by promoting remote, non-mechanized recreational opportunities. These beneficial impacts would increase the likelihood of achieving the MFO's targeted individual outcomes for the area, including 1) opportunities for solitary exploration of the area to gain a sense of adventure, 2) improvements in outdoor knowledge and increased self-confidence, and 3) enjoying the natural landscape to develop a closer relationship with the natural world.

Compared to Alternative A, Alternative B would be more beneficial for non-mechanized and river-floating users, because there would be an emphasis on these recreational activities, and more recreational facilities would be proposed than under Alternative A. There would be more

adverse impacts under Alternative B for mountain biking and motorized forms of recreation because of limitations and restrictions on these recreational activities.

Alternative C

The impacts on recreation under this alternative would be similar to those discussed under Alternative B, because the prescriptions would be similar, except that 30 miles of designated routes would be open to OHV use within the SRMA, providing more opportunities for motorized use of the area.

Alternative D

The impacts of Alternative D on the Dolores River Canyons SRMA would be similar to those discussed under Alternative A, because the SRMA would not be established under this alternative.

4.3.10.2.10.6 Labyrinth Rims/Gemini Bridges SRMA and Dee Pass SRMA

Alternative A

This alternative would not establish a Labyrinth Rims/Gemini Bridges SRMA, and recreation-related prescriptions for the current RMP are not specified. Currently, under an interagency cooperative agreement with the State of Utah, the BLM manages a permit system for in-river and shoreline use, and river resources protection along the Green River. A one-mile-wide scenic corridor along SR 313 and the Island in the Sky entrance road is managed by the MFO for camping at designated campgrounds and for protection of scenic quality. The Gemini Bridges Road is similarly managed to protect resource values. The White Wash Sand Dunes area is managed for open (cross-country) OHV travel, and OHV use is limited to existing routes in an area south of Tenmile Point Road. Current management and maintenance would continue for river takeouts, facilities, interpretive sites, and trails in the Labyrinth Rims/Gemini Bridges area. The 3-D, Crystal Geyser, Hellroaring Rim, Secret Spire, and Wipeout Hill areas would continue to be authorized for Jeep Safari and other uses.

Under this alternative, the impacts on recreation resources would be beneficial in the short term by continuing to provide recreational opportunities and facilities for resource user groups. In the short term, maintaining the existing management practices would adequately address the present level of river use through the river permitting system, and limitations and restrictions on camping and OHV use would continue to protect resource values in those areas where camping and OHV use restrictions are in place.

Resource use conflicts and user displacement in the Gemini Bridges area are presently occurring between motorized and mountain biking user groups (see recreation section 3.10.2 for a discussion of the area's current recreation conditions and trends). In the long term, the impacts on recreation resources in the area would be adverse because the lack of specific recreation-related prescriptions under this alternative would not address nor would be capable of adequately responding to the anticipated increase in visitor use of the area, the demand for recreational opportunities in the area, and the intensifying impacts of visitation on recreation resources.

Long-term, adverse impacts on recreation would result in a degraded quality of recreational experiences, unsatisfied user expectations, and diminishing recreational opportunities for all user groups.

Alternative B

Alternative B would establish the Labyrinth Rims/Gemini Bridges area as a 300,650-acre SRMA with 813 miles of designated D-Class roads/routes. The SRMA would have the same prescriptions as Alternative A but with the following additions: 1) the White Wash Sand Dunes would be managed for ecological restoration and scenic quality, and travel would be limited to designated routes; 2) camping would be prohibited within the Bartlett/Tusher/ Courthouse/Ten Mile Areas to protect resource values; 3) the river permit system would be expanded to further protect river resources; 4) camping would be limited to designated sites in high-use areas; and 5) backcountry areas would be managed for scenic motorized touring, and the Mill Creek Dinosaur Trailhead would be improved to accommodate passenger vehicles. Under this alternative, the SRMA recreational facilities and campgrounds would be increased by two campgrounds. The SRMA would manage focus areas for scenic drivers with one-mile protected viewshed corridors, for non-mechanized users (26,031 acres), and for mountain biking groups (17,530 acres), providing visitors with the opportunities to have quality river recreation, camping, on- and off-trail hiking, mountain biking, motorized backcountry, and scenic driving experiences. Under this alternative there would be no specific, intensive management for several mountain biking recreation focus areas (Tusher, Slickrock, Mill Canyon/Upper Courthouse, Bartlett Slickrock); there would be no specific, intensive management of the motorized backcountry touring focus area (Gemini Bridges/Poison Spider Mesa); there would be no specific, intensive management of the specialized (motorized) sport focus areas (Dee Pass, Airport Hills); and there would be no specific, intensive management of the specialized (non-motorized) BASE-jumping focus area at Mineral Canyon/Horsethief Point. By not specifically managing these potential focus areas, there would be the likelihood for increasing resource user conflicts and adverse and diminishing quality of experiences for motorized, mountain biking, and specialized groups in these areas.

Alternative B prescriptions would have long-term beneficial impacts on recreation through the management of focus areas for some specific recreational uses (including non-mechanized and mountain biking) that would reduce or eliminate the potential for use conflicts in the managed focus areas. Under this alternative the proposed increase in the number of recreational facilities would ease user demands for these facilities and increase the likelihood of recreation users having satisfying experiences. The proposal to extend the existing cooperative permitting agreement with the State of Utah to commercial river use would beneficially maintain satisfying river recreational experiences and opportunities by reducing crowding and adverse impacts. Limiting camping to designated sites in high-use areas would reduce recreation-related surface disturbance impacts to the area and would have long-term, beneficial impacts on recreation resources by preserving visual quality. Managing the SRMA to maintain quality recreational opportunities and to preserve recreation resources would increase the likelihood for beneficial recreational outcomes that include 1) a greater sense of adventure and heightened outdoor self-confidence from opportunities for individual exploration and enjoyment, 2) improved outdoor skills, and 3) opportunities to escape from crowds to gain a sense of freedom and to maintain mental health.

Compared to Alternative A, Alternative B would be more beneficial to recreation because more areas would be managed to reduce resource use conflicts; the area would be managed to preserve recreation resources; more facilities would be proposed to accommodate the anticipated increase in recreational use and demand; and more routes would be managed for mountain biking and non-mechanized recreation to meet the anticipated demand for these activities.

Alternative C

Alternative C would establish the Labyrinth Rims/Gemini Bridges area as a 300,650-acre SRMA with 881 miles of designated routes. The SRMA would have the same prescriptions as discussed under Alternative A, with the following additions: 1) expand the BLM/State of Utah river permit system to further protect river resources; 2) limit camping to designated sites in high-use areas; 3) manage backcountry areas for scenic motorized touring; 4) improve the Mill Creek Dinosaur Trailhead to accommodate passenger vehicles; and 5) consider development of an alternative mountain biking route on Poison Spider Mesa. Under this alternative, the SRMA would be managed to provide visitors with the opportunities to have quality river recreation, camping, on-trail and off-trail hiking, mountain biking, and backcountry motorized and scenic driving experiences.

Alternative C prescriptions would have long-term, beneficial impacts on all recreation user groups through expansion of facilities and the management of focus areas for non-mechanized (13,383 acres), motorized (18,165 acres), mountain biking (23,702 acres), and specialized (36,503 acres) user groups. Scenic driving corridor focus areas with 1/2-mile protected viewshed widths along Highway 313 and the Island in the Sky road would be managed for this user group. These prescriptions would beneficially reduce the potential for resource-use conflicts, similar to the discussion of impacts under Alternative B but with more beneficial impacts on resource users than Alternative B offers, because the SRMA would be managed with more focus areas for a broader range of recreational activities. The proposal to extend the existing cooperative river permitting agreement would have similar impacts as discussed under Alternative B.

Compared to Alternative A, Alternative C would be more beneficial to recreation for the reasons discussed under Alternative B: 1) more areas would be managed to reduce resource use conflicts, 2) more facilities would be proposed to accommodate the anticipated increase in recreational use and demand, and 3) more routes would be designated for motorized and mountain biking recreational use to meet the anticipated demand for these activities.

Alternative D

Alternative D would establish the 60,939-acre Dee Pass SRMA with a motorized trail-riding system at Dee Pass and the White Wash Open OHV-riding Focus Area. The proposed SRMA recreational facilities would be similar to those proposed under Alternative C but with additional facilities to enhance motorized use of the White Wash Sand Dunes. No recreational focus areas would be managed except for the above-mentioned 57,875-acre specialized (motorized) area at Dee Pass and a 3,064-acre Open OHV area at White Wash Sand Dunes.

The impacts on recreation under this alternative would be similar to those discussed under Alternative A. While designating an SRMA for motorized recreation and managing motorized

recreational use focus areas would reduce potential recreational resource use conflicts to some degree, the current conditions and trends toward adverse, long-term resource use conflicts between other recreational activities and user groups within the area would remain as cross country OHV use would continue in this area. Managing for motorized OHV use on designated trails and open OHV riding on the sand dunes would create opportunities for a sense of adventure, exploration, and excitement, with the likelihood of improvements in ATV-riding skills, a sense of freedom from urban living, and group enjoyment of the outdoors. Compared to Alternative A, the increased number of proposed recreational facilities under this alternative would provide a greater degree of resource protection and preservation.

4.3.10.2.10.7 Lower Gray Canyon SRMA

Alternative A

Under this alternative prescriptions from the Desolation-Gray Canyons Management Plan would be brought forward. Current conditions and trends would continue, which include heavy recreational river use along Lower Gray Canyon. The area would continue to be managed for recreational river use with commercial and private river use stipulations. River use would remain set at a maximum carrying capacity of a total of 35,000 passenger-days per year, which balances recreational use of the river with resource protection. Minerals development would not be allowed within the river corridor, and motorized travel on the river would be regulated to preserve river resources. These prescriptions would continue to have a long-term, beneficial impact on non-motorized recreation within the Lower Gray Canyon area, because the current Desolation-Gray Plan would continue to protect recreation resources and river use by limiting or prohibiting motorized boat travel; seeking to acquire private land within the river corridor in order to protect the river corridor; establishing daily launch limits of 6 groups/day and group size limits of 25 persons; and managing waste within the river and along the river corridor (BLM 1979).

Alternative B

Alternative B prescriptions would establish the Lower Gray Canyon as a 3,759-acre SRMA in coordination with the Price FO. The SRMA would be managed in accordance with the Desolation-Gray Canyons Management Plan, with the same group size and number limitations, and with the same resource protection prescriptions as discussed under Alternative A. The Desolation-Gray Plan would maintain opportunities for scenic river recreation on the Green River and opportunities for quality camping, hiking, and horseback riding within the river corridor. Prescriptions proposed under Alternative B would manage the existing riverside trails for non-mechanized recreational use, and vehicle camping would be limited to designated sites.

The impacts of these management decisions would be beneficial in the long-term on recreation resources within the proposed SRMA, because the area would continue to be managed under the protection of the Desolation-Gray Plan prescriptions with additional beneficial prescriptions to provide riverside recreational opportunities. By maintaining recreation resources and opportunities within the SRMA, the MFO's targeted outcomes of beneficial visitor experiences would likely be met. These individual experiences would potentially include improvements in outdoor recreation skills from easy access to natural landscapes, strengthened family ties and

friendships from group activities such as river floating and camping, and maintenance of mental health and reduction of mental stress from enjoyment of an uncrowded natural environment. Compared to Alternative A, Alternative B would have more beneficial impacts on recreation, because the alternative would expand the recreational opportunities within the proposed SRMA while continuing to protect resource values and current recreational opportunities.

Alternative C

The impacts of the prescriptions under this alternative would be similar to those discussed under Alternative B, because the prescriptions would be the same.

Alternative D

Under Alternative D the Lower Gray Canyon SRMA would not be established, but the Desolation-Gray Plan would be used to manage river use. The impacts to recreation would be similar to, but more protective of, river resources and opportunities than under Alternative A, because controlled surface-use leasing stipulations would also be applied to limit river corridor surface disturbances, with beneficial impacts for the recreation user.

4.3.10.2.10.8 Sand Flats SRMA

Alternative A

This alternative would apply decisions found in the current Sand Flats Management Plan. These include 1) a cooperative agreement with Grand County in which the county would be authorized to collect fees and participate in the operational management of the area; 2) limiting motorized OHV and mountain biking travel to designated road and trails; 3) provisions for fee uses; 4) campground development; and 5) development of camping, parking, and sanitation facilities. Management of the area would also include prescriptions for visitor protection, development of an entrance station, and information services. Camping would be limited to designated sites, and wood gathering and collecting would be prohibited.

While the prescriptions under the current Plan would, in the short term, beneficially address the need for recreational facilities in the area and control recreation-related surface disturbances, the long-term impacts to recreation resources and user groups would likely be adverse in that the prescriptions in the current RMP would not adequately address the intensifying user conflicts, the rising demand for OHV opportunities, the increasing number of visitors to the MPA, and the potentially adverse impacts that more visitors would have on the area's recreation resources. The lack of an adaptive-management plan for the area would, in the long term, have adverse impacts on the recreational experience and on user satisfaction because of over-crowding and resource use conflicts between mountain biking and motorized OHV user groups that would share the same travel routes.

Alternative B

Alternative B would establish the 6,246-acre Sand Flats SRMA with 20 miles of designated routes. The prescriptions would be the same as those discussed under Alternative A, except that the Slickrock Bike Trail would be closed to all motorized users. The SRMA would be managed

for a range of opportunities, including mountain biking on the Slickrock Trail, OHV challenge routes, and camping. No Surface Occupancy leasing stipulations would be applied to protect scenic and recreation values.

Prohibiting motorized OHV use of the Slickrock Trail would reduce the recreational opportunities of this group and would have long-term, adverse impacts on this group. Mountain bikers would enjoy beneficial impacts, including increased safety on the trail and reduced potential for resource-use conflicts and user displacement by motorized OHV users. Mountain bike users would benefit most from prohibitions on motorized use of the trail.

Beneficial impacts would also be produced through preservation and protection of scenic quality and other recreation values within the SRMA. The maintenance of recreational opportunities and resources within the proposed SRMA would also increase the likelihood of visitor-beneficial experiences that include physical challenges that could heighten the sense of adventure while improving outdoor skills, a greater sense of freedom from urban living, and strengthening family bonds and friendships by sharing outdoor experiences. Compared to Alternative A, this alternative would have more beneficial impacts because surface disturbance would be precluded, providing greater resource protection, a potential reduction in resource-use conflicts, and increased safety within the SRMA.

Alternative C

Alternative C would apply similar prescriptions to Sand Flats as does Alternative B, except that while the Slickrock Trail would be closed to ATV and four-wheeled vehicles for safety purposes, OHV motorcycles would be permitted on the trail. This alternative would also designate 23 miles of routes within the SRMA. The prescriptions would have impacts similar to Alternative B except that 1) the long-term, adverse impacts on some motorized users would be reduced because of expanded motorized (OHV motorcycle) opportunities; 2) the benefits to mountain bikers would be reduced by increased potential for user conflicts with and displacement by motorcycles; and 3) the level of safety along the Slickrock Trail would be diminished because of the combined motorized and mountain biking uses. Compared to Alternative A, the impacts of this alternative on recreation resources and user groups would be more beneficial, because the prescriptions would provide greater protection to resource values by precluding surface disturbance and provide higher quality recreational opportunities than Alternative A provides.

Alternative D

Alternative D would have the same prescriptions as in Alternative C except that a Slickrock Trail mountain bike free-ride area would be established. Also, Controlled Surface Use stipulations would be applied to oil and gas leasing and other surface-disturbing activities to limit these kinds of impacts to scenic values. The impacts of this alternative on recreation would be similar to those discussed under Alternative C, except that there would be more recreational opportunities that would benefit mountain bike users than under Alternative A from designation of the Slickrock mountain bike free-ride area.

4.3.10.2.10.9 South Moab SRMA

Alternative A

Under this alternative the Mill Creek Canyon hiking trailhead, the Ken's Lake recreation site, the Hidden Valley trailhead, and the Blue Hill trailhead would be managed as recreation sites. The Mill Creek trail, the Ken's Lake trail system, the Hidden Valley trail, the Steelbender/Flat Pass OHV/mountain bike route, the Behind the Rocks OHV route, the Strike Ravine OHV route, and the Kane Creek Canyon Rim OHV/mountain bike route would be managed as recreation trails. Camping would be limited to designated sites, with camping prohibitions on the west side of Spanish Valley and in Mill Creek.

The impacts to recreation resources and to motorized, mountain biking, and non-mechanized user groups under this alternative would be adverse in the long term, because continuation of current prescriptions under this alternative, without specific prescriptions that respond to resource impacts and recreation needs, would be inadequate. As discussed in Section 3.10.2, current conditions within the area include increasing resource use conflicts and non-motorized user displacement; a demand for more recreation facilities; heightened visitor use and recreation resource use; adverse impacts to undeveloped camping sites; and increasing resource degradation. These use conflicts, lack of adequate facilities, and resource degradation would continue to occur.

Alternative B

Alternative B would establish the 63,999-acre South Moab Destination SRMA, with the same prescriptions as in Alternative A with the following exceptions:

- recreation focus areas would be managed to provide opportunities for scenic driving along a one-mile-wide corridor that follows the LaSal Mountain Loop Road;
- Mill Creek Canyon, Behind the Rocks, and Hidden Valley Trail would be managed as non-mechanized focus areas (34,486 acres);
- Upper Spanish Valley would be managed as a mountain biking backcountry touring (2,255 aces) focus area;
- Potato Salad Hill would not be managed as a specialized (motorized) focus area;
- mountain biking speed-events would be managed in the Twenty Four Hours of Moab specialized (non-motorized) focus area (2,905 acres);
- additional emphasis would be placed on resource protection in the Ken's Lake area during development of a management plan for the area;
- new mountain biking and non-mechanized trails would be established; and
- existing trails would be extended in cooperation with municipal, state, and county agencies, and with private landowners.

The impacts on recreation from these prescriptions would be beneficial in the long term, because the establishment of the area as an SRMA and the management of recreation focus areas would increase the likelihood for satisfying scenic driving, mountain biking, and non-mechanized recreation by expanding opportunities and reducing the potential for recreation resource-use

conflicts and user group displacement. The creation and extension of hiking and equestrian trails and biking lanes would beneficially expand the recreation opportunities for these users. Management plan prescriptions for the SRMA would protect the recreational resources for all users of the area. Specialized recreation (motorized OHV) groups would be adversely impacted in the long term, because the Potato Salad Hill route would be closed to motorized travel, resulting in a loss of opportunities for challenging OHV hill climbing.

Maintaining resource values and expanding recreational opportunities for non-motorized use under this alternative would increase the likelihood that individuals would have beneficial experiences that include enjoyable physical exercise and an improved capacity for recreational activities through easy access to the area's natural landscapes, improved outdoor knowledge and outdoor skills development, heightened self-confidence, and developing a greater sense of outdoor independence. Compared to Alternative A, Alternative B would be more beneficial, because it would more effectively address the recreation resource-use concerns associated with increased visitation, resource-use conflicts, and recreation resource degradation, while also providing more recreational opportunities than Alternative A.

Alternative C

The prescriptions under this alternative would be similar to those discussed under Alternative B, except for the following: 1) additional resource protection in the Ken's Lake area would not be emphasized during recreation plan development; 2) the LaSal scenic driving focus area would have a corridor width of 1/2 mile; and 3) a 41-acre specialized (motorized) hill-climbing focus area would be managed at Potato Salad Hill.

The impacts to recreational opportunities for scenic, mountain biking, non-mechanized, and specialized motorized OHV users would be beneficial in the long term. These include expanded or maintained opportunities for these groups with the reduced potential for user-conflicts and displacement and the protection of recreation resources under the SRMA plan. Compared to Alternative A, this alternative would be more beneficial for the same reasons as discussed under Alternative B.

Alternative D

No South Moab SRMA would be established under this alternative. The prescriptions and impacts to recreation resources and user groups would be similar to those discussed under Alternative A.

4.3.10.2.10.10 Two Rivers SRMA

Alternative A

Alternative A would continue to manage the Colorado and Dolores Rivers under existing river management programs, which focus on providing facilities and regulating commercial and private river use. Under this alternative, boating management would be a continuation of current prescriptions, including promoting safe and enjoyable river use while permitting 30 commercial outfitters and up to 24,000 passenger-days per year. The impacts of this alternative would be

beneficial on river recreation and use in the short-term because management would be adequate for current levels of use. However, as demand increases for recreational use of the rivers (as recreational-use trends suggest [see Section 3.10.1.4]), resource-use conflicts and impacts to resources would likely increase, with long-term, adverse impacts on river resources and river running opportunities, particularly along river stretches that lie outside the proposed SRMA.

Alternative B

Alternative B would establish the 29,839-acre Two Rivers Destination SRMA, with the management objective to continue to provide high-quality river-related recreational opportunities on the Colorado and Dolores Rivers for river running and boating, hiking, and camping, and to protect outstanding river resource values. Group-size and daily launch limits would vary, depending on the type of boating recreational opportunities for which a particular river segment would be managed (see Table 4.69, SRMA Recreation Summary Table). The SRMA boating recreational opportunities would range from primitive, remote, and challenging whitewater river-running to scenic whitewater and flat water boating. A non-mechanized recreation focus area (23,479 acres) would be managed for river use and shoreline hiking within Westwater Canyon.

Under this alternative, additional public lands would be acquired for construction of additional facilities that would include river takeouts, parking and launch facilities, additional camping sites and additional access to camping sites. Prescriptions that would expand the number of facilities for recreational camping and boating would beneficially enhance the river experience for river floating and non-mechanized users. Prescriptions limiting the number of river permits and the size of permitted groups could adversely impact the river floating user group in the short term by potentially denying permits to those seeking to have a river experience. However, these prescriptions would provide long-term opportunities for satisfying recreational boating, shoreline hiking, and river floating experiences by beneficially dispersing river users and thus creating conditions of solitude, quiet, and a sense of naturalness. Managing the area for high-quality river-running, hiking, and camping would allow visitors to develop a closer relationship with the natural world by having satisfying recreational experiences. Being able to escape from crowds and from urban environments would allow visitors to maintain mental health, reduce stress, and encourage the development of a more outdoor-oriented lifestyle.

Compared to Alternative A, Alternative B would be more beneficial to recreation users because of the reduced likelihood for use conflicts under the Alternative B permitting system. More river resource protection prescriptions would be applied, and more recreational facilities would be provided to enhance the river experience.

Alternative C

Under Alternative C the boating management prescriptions would be similar to those in Alternative B, except that: 1) a proposed take-out facility at the Westwater Ranger Station would be developed separately from the existing station launch facility in order to reduce congestion at the ranger station and 2) permitted group size and daily launch limits would be greater than under Alternative B (i.e., group sizes would be nine persons greater, and launch limits would allow more individuals per day [see Table 4.69]). The impacts to river floating and non-mechanized groups would be similar to but more beneficial than those discussed under

Alternative B, because more opportunities would be available to have a river experience. Alternative C would be more beneficial to recreation users than Alternative A for the same reasons as discussed under Alternative B.

Alternative D

Alternative D would manage the Two Rivers area as a 14,056-acre Destination SRMA to provide opportunities for high-quality boating and camping. Boating prescriptions would be the same as those in Alternative C except that the permitted group size would be increased by seven persons, and daily launch limits would allow more people per day to access each river sector. The number and type of proposed facilities would be the same as discussed under Alternative C, but a non-mechanized river focus area would not be established. The impacts of this alternative on recreation would be both adverse and beneficial in the long term. Adverse impacts to those seeking a quality boating experience would be produced by expanding the maximum group size and number of permits for river segments within the SRMA, which would potentially reduce the river opportunities for those users who seek a less-crowded river experience. Beneficial impacts would be similar to those discussed under Alternative C, but to a lesser degree, because no focus area-related recreation opportunities for river use and hiking would be proposed under this alternative, and, therefore, there would be long-term, adverse impacts on opportunities for a river/shoreline hiking experience. This alternative would be more beneficial than Alternative A for the reasons discussed under Alternative C.

4.3.10.2.10.11 Utah Rims SRMA

Alternative A

Under Alternative A the Utah Rims area would continue to be managed under the current, and limited, recreation management program for the area. Prescriptions would include limiting travel to existing routes, managing Kokopelli's Trail for recreational use, managing the Bitter Creek campsite for camping, and managing Utah Rims for general recreation. The impacts of this alternative on the Utah Rims area would be adverse in the long term from the limited prescriptions that would not adequately address the adverse impacts to recreation resources from OHV use (e.g., surface disturbances to wildlife and range habitat, cultural resources, noise impacts to non-motorized users). The Alternative A prescriptions would not address resource use conflicts between OHV, mountain biking users, and non-mechanized groups, which would have adverse impacts on non-mechanized and mountain biking group recreational opportunities from OHV noise, incompatible trail use, and from user displacement by motorized users.

Alternative B

Under Alternative B Utah Rims would be managed as a 15,424-acre Community SRMA, with management goals to protect resource values while providing sustainable recreational opportunities for motorized and mountain biking scenic trail use, designated camping, and equestrian opportunities. Motorized and mountain biking travel would be limited to designated routes; a staging area would be developed for OHV group access to the trail system; limited camping facilities would be provided; and competitive, motorized events would be prohibited in order to maintain the area's single-track character. A separation of single-track use by time

period would be considered. No new recreational routes would be established under this alternative.

The impacts of this alternative on recreation would be beneficial in the long term for several reasons: 1) OHV-caused impacts to recreation resources would be reduced by limiting travel to designated routes; 2) the addition of facilities such as OHV staging areas and campsites would beneficially enhance the recreational experiences for motorized users by responding to this group's demand for more facilities; and 3) separating types of single-track use by time period would potentially reduce resource use conflicts. Managing the SRMA to enhance recreational experiences and expand the opportunities for motorized and non-motorized groups would have individual benefits for the area's visitors, including opportunities to enjoy strenuous physical exercise, improve outdoor skills and abilities, reduce physical and mental stress through escape from crowds and urban environments, and gain a greater sense of adventure by participating in challenging and enjoyable mechanized and non-mechanized recreational activities.

Compared to Alternative A, this alternative would have more long-term, beneficial impacts on recreation for several reasons: 1) it proposes a greater expansion of recreational opportunities for motorized and mountain biking resource users; 2) it proposes more recreational facilities to support the proposed SRMA trail system; 3) it would address OHV-caused impacts to recreation resources by controlling cross country travel; and 4) it would address resource-use conflicts and displacement concerns.

Alternative C

Alternative C prescriptions would be similar to those discussed under Alternative B; except that 1) the trail system would be expanded through acquisition of trail access across non-Federal lands; and 2) single-track routes would be added to the trail system upon adoption of the Travel Plan accompanying this RMP.

The impacts on recreation resources and user groups would be similar to, but more beneficial than, those discussed under Alternative B, because more opportunities for trail riding would be available from expansion of the trail system within the SRMA. The impacts of this alternative, when compared to Alternative A, would be similar to those discussed under Alternative B, because the prescriptions are similar (although no new motorized routes would be established in Alternative B).

Alternative D

Alternative D would not establish a Utah Rims SRMA, so the impacts would be similar to those discussed under Alternative A, but to a great degree, because user conflict could increase.

4.3.10.2.10.12 Moab ERMA

Under management common to the action alternatives, a management plan would be developed for the Moab ERMA to provide recreational management guidance for addressing changes in user demand and conditions. Facilities would be constructed, as needed, within the ERMA to ensure visitor safety, reduce user group conflicts, and protect resources. These prescriptions

would be beneficial to all user groups and to ERMA recreational resources by protecting the areas' recreational resources, maintaining recreational opportunities, and managing the area to meet visitor demands.

Alternative A

Consistent with the current RMP, Alternative A would continue current prescriptions to improve recreation sites and areas within the ERMA to balance the demand for recreational opportunities with protection of resources. The Kokopelli's Trail would be managed as a multi-day mountain bike and vehicle route with associated camping areas. The impacts of this alternative on motorized OHV and mountain biking groups would be adverse in the long term because current user conflicts along the Kokopelli's Trail would continue and most likely would intensify as increasing numbers of visitors use the trail for mountain biking and motorized use.

Alternative B

The MFO's targeted recreation management goals for the ERMA would be backcountry touring, and primitive hiking, backpacking, and equestrian use. Alternative B would manage 335,457 acres within the Bookcliffs area as an SRMA for non-mechanized recreation; the Sego Rock Art area would be managed for day-use (and provide a recreational opportunity to scenic drivers) and additional acquisition of adjacent land would be considered to expand this cultural/recreational interpretive site. Kokopelli's Trail would continue to be managed as a mountain biking and vehicle route with camping areas, and facilities would be developed at Lost Spring Canyon. Information boards would be installed along Interstate 70 main exits to inform visitors of such amenities. Current prescriptions would be followed to make improvements to sites and areas as necessary, and to manage the ERMA for very low visitation and provide a custodial-level of management for recreational use.

Except for the long-term, adverse impacts to the Kokopelli's Trail from use conflicts (the prescriptions for the trail would be the same as Alternative A), the impacts of prescriptions under this alternative would be beneficial in the long term because developing additional recreational facilities and additional recreational opportunities for motorized and non-motorized recreation would alleviate potential resource-use conflicts and demands within the proposed SRMAs.

Compared to Alternative A, this alternative would be more beneficial to recreation users because it would continue to follow current prescriptions for the ERMA, as well as expand recreational opportunities and potentially enhance recreation experiences through informal recreation focus areas and facilities development. Visitor benefits from recreation in the ERMA would include opportunities to improve outdoor skills, maintain mental and physical health, and explore and experience a sense of adventure in remote, backcountry locales.

Alternative C

Alternative C would have prescriptions similar to Alternative B, except that the Upper Fisher Mesa would be managed as a 1,365-acre area emphasizing mountain biking. The impacts on recreation resources and user groups would be similar to Alternative B, but more beneficial, as there would be more opportunities for mountain bikers under this alternative than under Alternative B.

Compared to Alternative A, this alternative would have impacts similar to Alternative B because the prescriptions are similar. However, the acreage of ERMA in Alternative C is greater than that in Alternative B, so recreation management in Alternative C is lessened.

Alternative D

Alternative D would have the same prescriptions as Alternative C. The impacts would be similar to those discussed under Alternative C except to a lesser degree because of the decreased number of acres within SRMAs. The impacts of this alternative, when compared to Alternative A, would be similar to those discussed under Alternative C, but to a lesser degree.

4.3.10.2.10.13 Special Recreation Permits

Alternative A

Alternative A would continue current management for special recreation permits, including competitive and non-competitive OHV events. The prescriptions under this alternative would have beneficial long-term impacts on recreation by protecting recreation resources through permit stipulations while providing recreational opportunities for motorized tour groups, non-mechanized (horseback) groups, hunters, commercial outdoor education (survival school) groups, and other commercial and private enterprises, and managing and protecting recreation resources. These stipulations protect resources and help provide a quality recreation experience.

Alternative B

The prescriptions under this alternative would be similar to those discussed under Alternative A, but with more specific stipulations for protecting natural and cultural resources. For example, permits would be required for all groups with 15 or more vehicles. Alternative B would have beneficial impacts similar to those discussed under Alternative A, but to a greater degree, because of the resource protection and preservation-related stipulations that would be associated with the issuance of special recreation permits. The stipulation that mandates a special recreation permit at 15 vehicles would beneficially impact user experiences because group size encounters would be smaller.

Alternative C

The prescriptions under this alternative would be similar to those discussed under Alternative B, except that permits would be required for all groups with 25 or more vehicles. Alternative C impacts, when compared to Alternative A, would be similar to Alternative B because the group size of 25 is closer to the group size of 15 (Alternative B) than that of Alternative A (group size of 50).

Alternative D

Alternative D would have the same prescriptions as Alternative B, except that permits would be required for groups with 50 or more vehicles. This alternative would have similar impacts on recreation as discussed under Alternative C, but to a lesser beneficial degree, because recreation and other resources would be receive less protection (given the larger group size) under the

special recreation permit process. In the short-term, this alternative's emphasis on providing more recreational opportunities to larger groups would have beneficial impacts (because permits would not be required until the threshold of 50 vehicles is reached) on all private user groups that require permits; however, the long-term impacts would be adverse because of the increased likelihood for recreation resource degradation and loss of recreation values. Compared to Alternative A, this alternative would be more beneficial in terms of reducing user conflict and protecting resources because there would be more protection and preservation-related stipulations on cultural and natural resources while still managing for support of the local economy.

4.3.10.2.11 Impacts of Riparian Decisions on Recreation Resources

Under all of the alternatives, riparian resource prescriptions would control recreational use, where necessary, and manage camping in riparian areas to reduce vegetation disturbances, in compliance with the MFO's Recreation Rules regarding dispersed camping (Appendix E) and The Guidelines for Recreation Management for BLM Lands in Utah (Appendix X). The recreation rules and guidelines stipulate that camping within riparian areas would be restricted if it was determined that the camping areas were becoming degraded, or camping would be reduced in order to minimize vegetation and sedimentation impacts. Restricting riparian dispersed camping areas would reduce recreational opportunities and have short-term, adverse impacts on users seeking this recreational activity, but the impacts would be beneficial in the long term as these areas would be managed to preserve the recreational resources within riparian areas for wildlife viewing, hiking, and sightseeing.

4.3.10.2.11.1 Alternative A

Under Alternative A, the riparian prescriptions discussed for management common to all alternatives would impact recreational opportunities while preserving the riparian resource. Additionally, current trends and conditions under this alternative would have indirect impacts on recreational opportunities: the current adverse impacts on riparian resources from OHV use, camping, trail erosion, livestock grazing, and exotic species encroachment (see Section 3.11.5.1) would continue to degrade riparian resources and would, in time, degrade recreational opportunities for wildlife viewing and sightseeing from the loss of riparian habitat. Scenic quality would be degraded and the risks of wildland fire in riparian areas would increase (with an associated increased risk of scenic quality degradation) from the invasion and establishment of exotic species. Livestock grazing in riparian areas could degrade such areas, reducing recreational opportunities for wildlife viewing, sightseeing, photography, day hiking, and camping for motorized OHV, mountain biking, and non-motorized recreational users.

4.3.10.2.11.2 Alternative B

Grazing prescriptions under Alternative B and riparian management common to all action alternatives would, where necessary, control livestock access to riparian habitat, restrict surface disturbing activities within riparian areas and floodplains, and restore at-risk or non-functioning riparian areas, which would improve riparian conditions and beneficially enhance riparian recreational opportunities in the long term by improving recreation resources. Control of

recreation in riparian habitat would be adverse in the long term for some potential surface-disturbing recreational opportunities, such as OHV use, because these activities would be reduced. However, prescriptions to reduce impacts to riparian resources would have long-term, beneficial impacts on other recreational opportunities and experiences (e.g., day hiking, equestrian, wildlife viewing, photography, and day camping) because of improvements to riparian resources. Compared to Alternative A, this alternative would be more beneficial to recreation users because it would apply more prescriptions to preserve and improve riparian recreational resources.

4.3.10.2.11.3 Alternative C

The impacts on recreation under this alternative would be similar to those discussed under Alternative B because the prescriptions concerning recreation use would be similar.

4.3.10.2.11.4 Alternative D

Impacts on recreation resources and opportunities under this alternative would be similar to Alternative B because prescriptions under management common to all action alternatives would manage riparian recreation resources for preservation, enhancement, and restoration.

4.3.10.2.12 Impacts of Soils/Watershed Decisions on Recreation Resources

4.3.10.2.12.1 Alternative A

The impacts of Alternative A on recreation would be negligible because either there are no specific soils prescriptions or they address grazing/saline soil concerns that would not impact recreational opportunities or resource uses.

4.3.10.2.12.2 Alternative B

Alternative B would have long-term, beneficial impacts on recreation from the closing of the Castle Valley and Mill Creek-Spanish Valley watersheds to all surface-disturbing activities, including oil and gas leasing and development. This would maintain recreation-related scenic quality in Castle Valley for sightseers and those touring the valley on the LaSal Mountain Scenic Byway, and for those participating in recreational activities in areas that have views of the valley. Steep slope areas (>30%) would also be restricted, with no surface disturbing activities allowed, with resultant decreases in soil erosion and scenic quality degradation. Compared to Alternative A, this alternative would be more beneficial to recreation because prescriptions would maintain recreation-related scenic quality.

4.3.10.2.12.3 Alternative C

The impacts would be similar to those discussed under Alternative B because the prescriptions are similar, except that the Castle Valley and Mill Creek-Spanish Valley watersheds would be no surface occupancy.

4.3.10.2.12.4 Alternative D

The impacts would be similar to those discussed under Alternative B, except that surface-disturbance stipulations would not be applied to the Castle Valley and Mill Creek-Spanish Valley watersheds. This would result in possible degradation to the recreation-related scenic quality.

4.3.10.2.13 Impacts of Special Designation Decisions on Recreation Resources

4.3.10.2.13.1 ACECs

Alternative A

Under Alternative A, no ACECs would be designated within the MPA. Thus, restrictions to protect recreation-related values would not be applied in this alternative. Therefore, these areas would be available for development, which would have adverse impacts on recreation resources as scenic quality could be diminished.

Under this alternative, the Ten Mile Wash area would be open to competitive motorized events, and the White Wash area would be open to competitive motorized events and cross-country OHV travel. This would continue to benefit motorized recreation users because the recreational opportunities for specialized and motorized OHV recreation groups would be maintained. The impacts on non-motorized users would continue to be adverse, because of the impacts of cross country travel on scenic resources (see Section 3.10.1.2.7).

Alternative B

Under Alternative B, approximately 610,086 acres would be designated as ACECs within the MPA for protection of relevant and important values that include cultural resources, paleontological resources, scenic quality, fish and wildlife, sensitive or endangered species, riparian resources and watersheds, and/or mitigation of wildland fire hazards.

Under this alternative, NSO minerals leasing stipulations would be applied to all ACECs, which would limit or prohibit surface-disturbance impacts to recreation resources, and have long-term, beneficial impacts on recreation because resources and opportunities would be preserved.

Vehicle-based, designated camping restrictions would be applied to the Behind the Rocks, Highway 279/Shafer Basin/Long Canyon, Colorado River Corridor, Upper Courthouse, Ten Mile Wash, and White Wash ACECs. Management of Canyon Rims would be consistent with the Canyon Rims Recreation Area Plan, and the Colorado River Corridor, Mill Creek, and Upper Courthouse Wash ACECs would be managed consistent with the SRMA prescriptions proposed for these areas. These actions, by managing ACECs through recreation plans and limiting vehicle surface disturbances, would tend to preserve recreation resources and provide a range of long-term recreational opportunities that would benefit recreation.

In the proposed Ten Mile Wash ACEC, no vehicular travel would be allowed from Dripping Springs to Green River, OHV competitive events would be prohibited in the White Wash and the

Cottonwood-Diamond Watershed Potential ACECs. Also, commercial guiding or special group permits would be suspended within the Cottonwood-Diamond Watershed Potential ACEC. These prescriptions would restrict and/or prohibit motorized OHV, mountain biking, and specialized recreational use, which would have long-term, adverse impacts on opportunities for these recreational user groups. However, the emphasis on cultural resource interpretive rock art viewing along Wall Street in the Highway 279/Shafer Basin/Long Canyon ACEC, and proposed hiking trail construction in the Wilson Arch ACEC would beneficially expand the recreational opportunities for scenic driving, mountain biking, and non-mechanized recreational user groups in these areas.

Compared to Alternative A, Alternative B would be more beneficial for recreation because ACEC prescriptions would maintain recreation resources, limit surface disturbances, and, through SRMA-related management of these areas, provide a greater range of recreational opportunities for all resource user groups.

Alternative C

Under this alternative, approximately 63,758 acres would be designated as ACECs for preservation of relevant and important values (11% of the area proposed under Alternative B). More area would be open to oil and gas leasing, geophysical exploration, and salable minerals disposal than Alternative B, but less than Alternative A (see 4.3.10.2.7 above).

In areas proposed for ACEC designation under this alternative, and in non-ACEC proposed areas, recreation-related prescriptions would be similar to those discussed under Alternative B. Prescriptions that differ from Alternative B, because these areas are not proposed for ACEC designation under this alternative, and would affect recreation under this alternative include the following:

Bookcliffs – Standard and timing and controlled surface use minerals leasing stipulations would be applied on approximately 54,174 acres within the Bookcliffs area (there would be no proposed ACEC designation under this alternative) with permitted minerals-related surface-disturbances that could impact recreation-related scenic quality in the long term. The impacts on recreation resource users would be adverse, as approximately 1,563 acres of surface disturbances from oil and gas development are predicted within the Bookcliffs RFD Area during the 15-year life of the Plan.

Canyon Rims – Standard and timing and controlled surface use leasing stipulations would be applied to approximately 23,400 acres (the area proposed as an ACEC under Alternative B). Permits would be required for motorized recreational use, if monitoring indicates long-term damage to resources, and permits would be required for groups using more than 25 vehicles. Competitive events would be prohibited. Prescriptions for the Canyon Rims area would permit minerals-related surface disturbances within the area, with subsequent long-term, adverse impacts on recreation resources and on the recreational experiences and opportunities for all user groups that recreate in the area. Adaptive-management monitoring and permitting of motorized recreational use would reduce these potentially adverse impacts to non-motorized recreational user groups by limiting user conflicts. Prohibitions on competitive events would limit the

opportunities for specialized recreational use, with long-term, adverse impacts on the specialized, motorized, and mountain biking user groups.

White Wash – Competitive motorized events would be allowed. This prescription would expand the recreational opportunities for specialized recreation in this OHV recreational focus area, with beneficial long-term impacts on specialized and motorized users.

Compared to Alternative A, this alternative would be more beneficial for recreation resources and users because the area open to oil and gas development surface disturbances would be less than Alternative A, and the range of recreational opportunities would be maintained or expanded.

Alternative D

Alternative D would not designate any ACECs for the protection of relevant and important resources values. Thus, restrictions to protect these values would not be applied in this alternative. Therefore, these areas would be available for development; this would have adverse impacts on recreation resources, similar to Alternative A.

4.3.10.2.13.2 Wild and Scenic Rivers

Alternative A

Under this alternative, no suitability determinations would be made for any eligible river segment within the MPA. Under the 1985 RMP, segments 1, 2, and 3 along the Colorado River and all Dolores River segments, with a total length of 46 river miles, were determined to possess ORVs and be eligible for suitability determinations. The impacts to recreation resources and users along the eligible Colorado and Dolores river segments would be negligible because they have been and would continue to be managed to prevent changes to their character (up to 1/4 mile on each side of the eligible river segments) until suitability determinations were made by the MFO. The impacts to recreation resources along the remaining river corridors within the MPA could be minimal because these river corridors would be protected from surface disturbances on a case-by-case basis until a suitability determination is made.

Alternative B

Under Alternative B, 28 river segments (totaling 287.5 river miles) would be recommended as suitable for Wild, Scenic, or Recreational classification under the National Wild and Scenic Rivers System (NWSRS). Those segments recommended as suitable for Wild classification would be managed under VRM Class I objectives; Scenic and Recreational-recommended segments would be managed under VRM Class II objectives. These VRM classes would protect scenic values. The impacts to recreation would be beneficial in the long term because recreation resources would be preserved along these river corridors, surface disturbances would be limited to VRM Class II objectives, and recreational opportunities would be available to all user groups along the river corridors. Compared to Alternative A, this alternative would be more beneficial to recreation because more river miles would be preserved for their scenic, recreational, and wild qualities (6 times more river miles than Alternative A) while managing for a range of

recreational opportunities, including boating and sightseeing, within these Wild and Scenic River corridors.

Alternative C

This alternative would recommend 127.3 river miles (10 river segments) as suitable for Wild, Scenic, or Recreational classification. The impacts on recreation within river segments recommended as suitable would be beneficial, because VRM Class I and Class II objectives would be applied as discussed under Alternative B. Compared to Alternative D, this alternative would be more beneficial to recreation for similar reasons as discussed under Alternative B. However, because Alternative A would continue to protect all of the eligible rivers on a case-by-case basis, it may not be as protective as A.

Alternative D

Alternative D would not recommend any eligible river segments as suitable. The river segments would not be managed to protect ORVs or their free-flowing conditions, with impacts similar to those discussed under Alternative A. Compared to Alternative A, this alternative would have more long-term, adverse impacts on river-related recreational opportunities and experiences because the recreation resource would receive less protection, be potentially open to more surface disturbances, and be less likely to satisfy the recreational expectations of river users.

4.3.10.2.13.3 Wilderness Study Areas (WSAs)

BLM has no discretion to manage WSAs through planning, with the exception of decisions relating to VRM designation and motorized vehicle use (closing ways or limiting use to ways that were identified in the WSA). Under management common to all alternatives, Wilderness Study Areas (WSAs) would continue to be managed consistent with the Interim Management Policy for Lands Under Wilderness Review (IMP).

Alternative A

The MFO currently manages WSAs to preserve their wilderness values under VRM Class I objectives. The impacts on recreation resources and on opportunities for all resource user groups from continuing to manage these areas to preserve their wilderness characteristics would continue to be beneficial in the long term because the areas have been and would continue to be managed so that their wilderness suitability would not be impaired, but would still allow all recreational activities that would not degrade existing wilderness character. All inventoried routes within WSAs would be open to OHV use under Alternative A (except those in the Behind the Rocks WSA, which was closed to OHV in the Grand RMP), but the numbers of miles of routes designated in WSAs would be fewer under the action alternatives.

Alternatives B–D

The impacts on recreation resources within the WSAs under the action alternatives would be similar to those under Alternative A because the IMP would be applicable. However, managing OHV vehicle use as either closed or limited to designated routes in WSAs under the action

alternatives would reduce the opportunities for motorized recreation, with adverse impacts on this user group. The impacts on other user groups would be negligible because the range of opportunities would not change from current conditions. Compared to Alternative A, the action alternatives would have adverse, but minor, impacts on motorized recreational opportunities. because all inventoried routes within WSAs would be open to OHV use under Alternative A, but the numbers of miles of routes designated in WSAs would be fewer under the action alternatives. In Alternative B, no inventoried routes would be open to motorized or mechanized travel. In Alternative C, 3.1 miles of route would be designated, and in Alternative D, 16 miles of route would be designated.

4.3.10.2.14 Impacts of Special Status Species Decisions on Recreation Resources

Actions common to all of the alternatives for managing special status species would have long-term, beneficial impacts on recreational opportunities and experiences for all user groups by continuing to protect special status wildlife and plant species for sightseeing and nature study. Restrictions due to special status species management could impact the ability of recreationists to engage in permitted activities, as routes or areas could be temporarily prohibited to protect special status species.

4.3.10.2.15 Impacts of Travel Management Decisions on Recreation Resources

4.3.10.2.15.1 OHV Travel

Alternative A

Under Alternative A, 620,212 acres would be open to cross-country OHV travel, 1,196,920 acres would continue to be designated as limited to designated and inventoried routes, and 24,454 acres would be closed to OHV travel. Managing OHV use under the current open designation would be beneficial for motorized OHV recreational users because cross-country OHV use would continue to provide long-term recreational opportunities for this resource user group. However, the surface disturbance impacts to soils, water quality, scenic quality, cultural resources, wildlife, and vegetation (all components of the recreational experience) would continue to adversely impact recreation in the long term in the area designated as open to OHV use. Other OHV impacts to recreation would include the impacts associated with OHV noise and the potential user conflicts and user displacement associated with OHV use. The long-term impacts of OHV prescriptions under this alternative on natural and cultural resources, and on hikers, backpackers, mountain bikers, and equestrians, would be adverse because, as discussed in Sections 3.10.2.6 and 3.10.2.7, OHV use within the MPA is increasing, with the likelihood that OHV-related resource and recreation user conflicts with non-motorized users would continue to intensify.

Under this alternative, 6,199 miles of maintained and un-maintained routes (B- and D-Class roads, respectively) would be designated for travel, but no miles would be designated for motorized, single-track use (i.e., motorcycles). The impacts on recreation would be negligible, as B- and D-Class routes are currently being used for recreation access. The impacts on motorcycle recreation would also be negligible, as 99% of the MPA would remain either open or limited to designated and inventoried-route recreation and access.

Alternative B

Under Alternative B, no acres would be designated as open to cross-country OHV use, with all OHV travel (1,475,074 acres) limited to designated routes and 347,424 acres designated as closed to OHV travel. Site-specific route adjustments would be allowed, based on access needs and resource constraints, and routes would be closed or restricted if monitoring determines that OHV use was adversely impacting an area's natural character. The long-term impacts on recreation resources from these travel actions would be beneficial because the potentially adverse impacts to natural and cultural resources from cross-country OHV use would be eliminated by restricting this form of travel to designated routes (see Section 3.10.2.7 for a discussion of OHV impacts). The effects of OHV route designations on recreation resource users would be variable: scenic drivers, mountain biking, and specialized motorized recreation users would not be impacted as these user groups typically follow designated routes; motorized OHV users would be adversely impacted because the recreation-related travel opportunities for motorized users would be reduced; non-mechanized users would be beneficially impacted because restricting motorized users to designated routes and closing routes would reduce the likelihood of resource use conflicts between the two user groups.

Under this alternative, no miles would be designated for motorized, single-track use, with adverse impacts on this user group because no recreational opportunities would be available. Approximately 3,278 miles of B- and D-Class roads (56% of the miles of designated routes proposed under Alternative A) would be designated as travel routes.

Compared to Alternative A, this alternative would have more adverse impacts on those recreational opportunities associated with cross-country OHV and motorcycle use because these opportunities would be eliminated. However, this alternative would also have more beneficial impacts on recreation resources and on recreational user groups than Alternative A because: 1) resource use conflicts would more likely be reduced through management of OHV route designation and use, and 2) surface disturbance-related impacts to natural and cultural resources from cross-country OHV use would be greatly reduced.

Alternative C

Alternative C would designate 1,866 acres as open for cross-country OHV use, 1,481,334 acres as limited to designated routes, and 339,298 acres as closed to OHV use. The impacts on recreation resources and user groups would be similar to those discussed under Alternative B because 1) the acreage designations are similar, with similar prescriptions, and 2) the open OHV area lies within a proposed Open OHV recreation focus area (1,866 acres within White Wash Sand Dunes) that would be managed for that activity.

This alternative would designate 123 miles of motorized (motorcycle), single-track routes. Approximately 3,653 miles of B- and D-Class roads (63% of route-miles designated under Alternative A) would be designated as travel routes. Single-track route designation would be beneficial, in the long term, to motorized users as opportunities for this form of recreation would be available. The impacts to recreation-related travel along B- and D-Class roads would be similar to the impacts under Alternative B because the limitations on travel opportunities would be similar.

The impacts comparison between Alternative A and this alternative would be similar to the discussion under Alternative B, except that the adverse impacts to OHV recreation users would be reduced because the opportunities for cross-country OHV use, though limited, would be available. The impacts on motorcycle users would be more adverse because fewer opportunities would be available than under Alternative A.

Alternative D

This alternative would manage 3,064 acres as open to cross-country OHV travel, 1,762,083 acres as limited to designated OHV routes, and 57,351 acres as closed to OHV travel. Under this alternative, the impacts on OHV recreation users would be beneficial because OHV recreational travel opportunities along designated routes would be available on approximately 97% of the MPA. The open OHV areas would have negligible impacts on recreation resources because the cross-country OHV areas would be within Open OHV and Specialized Motorized focus areas (the Dee Pass motorized trail area and White Wash Sand Dunes) that are currently being used as OHV play areas.

Alternative D would designate approximately 3,805 miles of B- and D-Class roads (66% of Alternative A), and 219 miles of motorized (motorcycle), single-track routes. The impacts would be similar to those discussed under Alternative C, though to a more beneficial degree for motorized users, because more miles of single-track use (and opportunities for motorized recreation) would be available.

Compared to Alternative A, this alternative would have more beneficial recreational resource protection because less area would be open to cross-country OHV use. Because Alternative D would provide fewer opportunities for cross-country travel, the impacts on motorized OHV and motorcycle use would be more adverse than Alternative A, but more beneficial to non-motorized users by preserving scenic resources due to the lack of cross country OHV travel.

4.3.10.2.15.2 Mountain Biking

Alternative A

Under Alternative A, mountain biking would be allowed along the same OHV routes as motorized travel, with 4 miles of routes along the Jackson and Portal trails managed specifically for mountain biking travel. The impacts of these prescriptions on recreational mountain biking travel would be adverse in the long term because the actions do not address the current conditions within the MPA that indicate increasing recreation user conflicts, mountain biking user displacement, and recreational demand for mountain biking opportunities (see Sections 3.10.2.6 and 3.10.2.7). Without addressing these recreational concerns, recreational opportunities and the likelihood of satisfying mountain biking experiences would be diminished in the long term.

Alternatives B–D

Under the action alternatives, additional miles of routes would be designed and managed for mountain biking trail use. The miles of proposed routes range from 75 miles under Alternative B

and 150 miles under Alternative C, to 300 miles under Alternative D. All of these alternatives would increase recreational opportunities for this user group and reduce resource user conflicts and user displacement by motorized OHV users from designating additional routes for mountain bikers, which would have long-term, beneficial impacts on this form of travel. Compared to Alternative A, these alternatives would be more beneficial to mountain biking recreation because they would address the user conflicts between motorized recreation and mountain biking.

4.3.10.2.15.3 Non-Mechanized Travel

Alternative A

Under Alternative A, non-mechanized travel (i.e., hiking, backpacking, and equestrian use) would be allowed along the same OHV routes as motorized and mountain biking travel, with similar adverse impacts to this form of travel for reasons as discussed above under Alternative A in Section 4.3.10.2.15.2: increasing numbers of users, user demand, and user conflicts. It should be noted that hikers and equestrian users are not restricted to designated routes.

Alternatives B–D

Under the action alternatives, additional miles of trails would be designed and managed for non-mechanized travel. The miles of proposed routes range from 25 miles under Alternative B and 50 miles under Alternative C, to 100 miles under Alternative D. The impacts of these prescriptions would be similar to those discussed above for Alternatives B through D for non-motorized/mechanized travel, except that the impacts would be applicable to non-mechanized users, with a similar comparison to Alternative A, except that the impacts would be applicable to non-mechanized recreation.

4.3.10.2.16 Impacts of Vegetation Decisions on Recreation Resources

4.3.10.2.16.1 Alternative A

No prescriptions for vegetation management are specified under Alternative A. However, prescriptions for Fire Management would have similar impacts on recreation resources, as discussed in Section 4.3.10.2.3.

4.3.10.2.16.2 Alternatives B–D

The impacts on recreation of vegetation prescriptions common to all of the action alternatives would be similar to those discussed under Fire Management because the vegetation prescriptions would be similar. Vegetation communities would be managed for fire suppression, stabilization, and fuel reductions; vegetation treatments would be applied to control exotic and invasive species using methods similar to those for fire management; re-seeding, restoration, and rehabilitation of disturbed areas would use techniques similar to those used for areas impacted by prescribed and wildland fire. Potentially adverse short-term impacts to recreation would be produced by the drought management prescriptions for Extreme or Exceptional conditions if OHV use was restricted and if areas were closed to public entry during the time that these prescriptions were in effect. Under extreme drought conditions, specialized, motorized, and

mountain biking recreational opportunities would be adversely reduced in the short term as access could be restricted; under exceptional drought conditions, recreational opportunities for the aforementioned user groups and non-mechanized users would be adversely impacted because areas could be closed to public entry to protect sensitive soils and reduce the risk of wildland fire. Compared to Alternative A, the action alternatives would be more beneficial to recreation because there are no specified prescriptions under Alternative A to enhance vegetation-related recreation resources, while the action alternatives would apply adaptive management, erosion control, fuel reductions, and vegetation treatments to reclaim and restore vegetation resources.

4.3.10.2.17 Impacts of Visual Resource Decisions on Recreation Resources

Prescriptions common to all alternatives would have long-term, beneficial impacts on visual/scenic quality recreation resources on 354,015 acres through the management of WSAs and designated wilderness areas as VRM Class I areas. The scenery in the WSAs would be preserved for public enjoyment.

Under all of the action alternatives, recreational development (e.g., facility construction) would be required to meet both recreational and VRM management objectives if that development was sited within the foreground of sensitive viewing areas, in order to reduce visual contrasts that would detract from recreational scenic quality. This prescription would be beneficial to recreational resource users in the long term because it would require mitigation of potential impacts to visual/scenic quality in order to maintain recreational opportunities that include high scenic quality. No surface occupancy leasing stipulations (or closed to oil and gas leasing) would be applied to all VRM Class I areas for oil and gas development and other surface-disturbing activities, with long-term, beneficial, preservation-related impacts on recreation scenic quality.

VRM Class II areas would be managed with a controlled surface use stipulation for oil and gas leasing and other surface disturbing activities. (Note that acreages in Alternative A are inventory class, while acreages in Alternatives B-D are management class). This stipulation would mitigate impacts to scenic quality by requiring screening and other actions, and thus, to recreation users. Table 4.70 displays VRM Class I and VRM Class II acreage, by alternative.

Table 4.70. VRM Management Classes I and II Acreage, by Alternative

VRM Class	Alternative A	Alternative B	Alternative C	Alternative D
I	349,110	453,462	358,911	349,617
II	401,015	373,647	365,566	245,773

4.3.10.2.17.1 Alternative A

Under the Alternative A/VRM inventory, the impacts on recreation-related visual resources would be beneficial because Alternative A would attempt to manage recreation-related scenic quality as determined by the MFO's VRM inventory for scenic quality and viewer sensitivity (see Section 4.3.18 for a description of VRM Class acreages designated under each alternative and the VRM inventory process). As discussed above, WSAs, designated wilderness areas, and other VRM Class I areas (including the Negro Bill Outstanding Natural Area) would be managed

to preserve their natural and scenic qualities, with long-term, beneficial impacts to recreation resources and to all user groups as scenery is preserved for their enjoyment. As mentioned in Section 4.3.18, under this alternative, the VRM inventory classes would become VRM management classes.

4.3.10.2.17.2 Alternative B

Under Alternative B, 453,462 acres would be managed to prevent or mitigate potential surface disturbances to visual/scenic quality under VRM Class I visual objectives, which would have more long-term, beneficial impacts on all recreational resource user groups as more scenery would be protected. Therefore, the impacts to recreation under this alternative would be more beneficial in the long term than Alternative A/VRM inventory.

4.3.10.2.17.3 Alternative C

Compared to Alternative A, this alternative would manage 9,910 more acres under VRM Class I objectives for visual resource protection than was determined by the inventory, with long-term, beneficial impacts to all user groups as more scenery would be protected. This would reduce surface-disturbing impacts to recreational scenic resources and resource users that expect high scenic quality. When compared to Alternative A, fewer acres within the MPA under this alternative would be managed to preserve high-quality scenic landscapes under VRM Class II management, and more acres would be managed to allow surface disturbances, development, and man-made alterations of the existing landscape. These surface disturbances could degrade the scenic qualities that recreation users value.

4.3.10.2.17.4 Alternative D

Compared to the Alternative A, this alternative would manage 507 more acres under VRM Class I objectives for the highest level of scenic quality protection. However, impacts to recreation-related scenic resources under this alternative would be more adverse in the long term because less of the MPA would be managed for the preservation of high scenic quality, and more of the MPA would be managed for permitted surface-disturbances and resources development. The impacts on recreation resources and user groups would be adverse in the long term because fewer areas, when compared to Alternative A, would be managed to maintain high scenic quality, which would diminish the recreational experiences and reduce recreation opportunities for all recreation resource user groups.

4.3.10.2.18 Impacts of Wildlife and Fisheries Decisions on Recreation Resources

Continuing to implement the Hatch Point, Potash-Confluence, and Dolores Triangle habitat management plans (HMPs) and conducting migratory bird conservation projects would benefit recreational wildlife viewing in the long term by maintaining deer, elk, bighorn sheep, raptor, game bird, and migratory bird populations under all of the alternatives.

Under prescriptions common to all action alternatives, 9,278 acres would be managed along the rim of Hatch Point as part of the Lockhart bighorn sheep habitat area and 317,523 acres on

grazing allotments would be managed as bighorn sheep habitat. In order to benefit wildlife populations, forage in specified grazing allotments would be reallocated to wildlife, native and naturalized fish and wildlife species would be re-introduced into suitable and/or historic ranges, and dispersed camping would be restricted in riparian areas (see Section 4.3.10.2.11) to protect riparian wildlife habitat. All of the prescriptions would be beneficial to recreation resources and to all recreation users in the long term by enhancing the opportunities for wildlife viewing and sightseeing.

4.3.10.2.18.1 Alternative A

Prescriptions to protect desert bighorn sheep habitat on 42,500 acres within the Potash-Confluence HMP by preventing major human disturbances during lambing and breeding seasons would have adverse impacts on recreational opportunities by limiting, in the short-term, those activities that produce noise or that tend to have concentrated group use that could disturb wildlife. Recreational user groups that would be affected in the short term would include motorized, mountain biking, and specialized groups. The long-term impacts would be beneficial for all recreation user groups by improving the opportunities for wildlife viewing.

4.3.10.2.18.2 Alternative B

Under this alternative, dispersed camping in riparian areas would be restricted or prohibited, except in designated campsites, and camping would be prohibited in Shafer Basin and Long Canyon (encompassing approximately 13,500 acres) to protect bighorn sheep habitat. These prescriptions would adversely reduce recreational opportunities for long-term, dispersed camping in these areas. Compared to Alternative A, this alternative would be more adverse to recreational users because more restrictions would be placed on dispersed camping opportunities than under Alternative A.

4.3.10.2.18.3 Alternative C

The impacts to recreation would be similar to those discussed under Alternative B because the prescriptions would be similar, although the acreage protected would be somewhat less.

4.3.10.2.18.4 Alternative D

Under this alternative, prescriptions would be the same as under Alternative B, except that camping would not be restricted to designated camping sites in lambing areas, benefiting those who value this experience. The impacts to dispersed camping recreational opportunities would be similar to those discussed under Alternative B, but to a lesser degree, because more areas would be open to camping in bighorn sheep habitat. Compared to Alternative A, this alternative would have impacts similar to those discussed under Alternative B.

4.3.10.3 Summary of Impacts

Table 2.2 (of Chapter 2) summarizes the impacts of the various alternatives and their program actions on recreation.

4.3.11 RIPARIAN RESOURCES

Within the MPA, riparian areas are typically associated with perennial, intermittent, and ephemeral streams, as well as isolated springs and other water sources. Management decisions with the potential to impact riparian resource health, the proper functioning condition (PFC) of streams, water resources necessary to riparian zone establishment and survival, or the physical environment on which riparian vegetation depends (e.g., stream stability) were the decisions evaluated in this analysis.

Analysis of impacts to the riparian resources of the MPA were conducted primarily by overlaying proposed management decisions (e.g., surface disturbances due to grazing, OHV travel, camping and other recreational use, and woodland harvest) upon the 13,450 acres of riparian areas in the MPA, as identified in the GIS-based, Utah GAP database (Lowry et al. 2005) of vegetation types. Quantitative impacts were measured as acres of riparian resource. Where GIS or other quantitative data were unavailable, potential impacts to riparian resources were analyzed qualitatively, based on these same criteria.

Under all alternatives, management actions for the following resources would result in negligible impacts to riparian resources: air quality, cultural resources, health and safety, paleontological resources, and visual resources. This is because protecting air quality, maintaining safety around AML sites and reducing the risks of hazardous materials spills and spill-site cleanup, protecting cultural resources under Section 106, protecting known fossil areas for fossil scientific study and recreational fossil collection, and protecting scenic quality would neither degrade nor improve the water, soil and vegetation components that comprise riparian resources. Accordingly, the impacts of management actions for each of these resources are not analyzed further in this section.

4.3.11.1 IMPACTS OF FIRE MANAGEMENT DECISIONS ON RIPARIAN RESOURCES

Under all alternatives, fire management would follow the guidelines in the Utah Land Use Plan Amendment for Fire and Fuels Management (LUP; BLM 2005c). Management actions under the Utah LUP would have generally beneficial impacts on riparian resources, since non-fire fuel treatments would promote diversity in native riparian vegetation types and reduce exotic species.

4.3.11.2 IMPACTS OF LANDS AND REALTY DECISIONS ON RIPARIAN RESOURCES

Under all action alternatives, riparian areas are protected from the impacts of lands and realty decisions because of the stipulation that requires no surface disturbing activities within 100 meters of riparian areas.

However, an exception could be authorized if there are no practical alternatives, impacts could be fully mitigated, or the action is designed to enhance the resource values (see Appendix C, Stipulations Applicable to Oil and Gas Leasing and Other Surface Disturbing Activities). In such instances that an exception is granted because there is no practical alternative, mitigation measures such as the Standards for Pipeline Crossings (See Appendix H) and the BMPs for soils and minerals would be employed.

LTAs could acquire riparian areas, and LTA criteria call for the retention of those already in public ownership. This would beneficially impact riparian resources as they would be protected by the stipulations placed upon them under all action alternatives.

4.3.11.3 Impacts of Livestock Grazing Decisions on Riparian Resources

In general, restricting grazing from riparian areas would provide long-term protection and enhancement of riparian areas because it would eliminate any improper livestock management practices that could result in the loss of riparian vegetative and cover and the trampling of riparian soils. Improper grazing practices may result in adverse impacts due to decreased growth or loss of riparian vegetation and possible loss or degradation of riparian soils, water quality, streambed and bank structure, and habitat quality." In this analysis, the impacts of livestock grazing decisions upon riparian resources are measured in the acres of riparian area that could become unavailable for grazing. Table 4.71 shows the riparian areas that could become unavailable due to grazing management decisions under each alternative.

Table 4.71. Grazing Restrictions (i.e., in Riparian Areas, by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Acres Unavailable (out of 13,450 acres)	Approx.1,000	4,422	1,169	Approx.500
% of Total Riparian	9	17	12	9

4.3.11.3.1 Alternative A

Under Alternative A, current management, which prohibits grazing in the South Sand Flats, North Sand Flats, Between the Creeks, Pear Park, Beaver Creek (itself), Spring Creek, Cottonwood, Bogart, and Diamond allotments, would continue. These prohibitions prevent grazing on approximately 9% of the total riparian acres within the MPA (see Table 4.71), resulting in beneficial impacts to riparian habitat in these areas, in the forms described above.

4.3.11.3.2 Alternative B

In addition to the grazing exclusions specified under Alternative A, grazing would not be authorized in the Ida Gulch, River, Mill Creek and Professor Valley allotments. Grazing would also be unavailable in the riparian areas of the following drainages under Alternative B: Ten Mile from Dripping Spring to the Green River, Day Canyon, Mill Creek Canyon, Seven Mile Canyon, East Coyote, Kane Springs, Lower Gray Canyon of the Green River, and Hatch Wash. Therefore, under Alternative B, grazing would not be permitted on approximately 34% of the total riparian acreage within the MPA—an increase of 74% in the amount of unavailable riparian acreage, compared to Alternative A (see Table 4.71). More riparian acres would be unavailable for grazing under Alternative B than under any other alternative.

4.3.11.3.3 ALTERNATIVE C

Grazing would not be allowed in the following allotments: Bogart, Cottonwood, Diamond, and Mill Creek. The riparian areas unavailable for grazing under Alternative C are the same areas as under Alternative B, with the exception of Day Canyon, Kane Springs, Lower Gray Canyon of the Green River, and Hatch Wash, which would remain available for grazing. Therefore, in total, grazing would be prohibited on approximately 12% of riparian areas within the MPA under Alternative C, or 26% more than Alternative A (see Table 4.71). Alternative C would protect more riparian acreage than Alternative A, but not as much as Alternative B.

4.3.11.3.4 ALTERNATIVE D

Grazing would be available in the Cottonwood, Diamond, and Bogart allotments. This would adversely impact riparian resources found in those allotments, including Cottonwood Wash, Diamond Canyon and Nash Wash. Impacts would be greater than under Alternative A because the acreage of riparian exclusion is far less in Alternative D.

4.3.11.4 IMPACTS OF MINERAL RESOURCE DECISIONS ON RIPARIAN RESOURCES

Mineral resource decisions that would affect riparian resources include the continuation of existing mineral withdrawals and the application of a controlled surface use (CSU) stipulation, which would prohibit surface disturbing activities within the 100 year floodplain or within 100 meters of riparian areas.

Under all alternatives, adverse impacts to riparian resources from mineral development would be avoided because the controlled surface use stipulation requires a proponent to move operations up to 100 meters to avoid riparian areas, benefiting riparian resources by protecting them from surface disturbance.

However there are exceptions to this stipulation which allow for development in riparian areas if there are no practical alternatives, impacts could be fully mitigated, or the action is designed to enhance the resource values (see Appendix C). In such instances that an exception is granted because there is no practical alternative, mitigation measures such as the Standards for Pipeline Crossings (See Appendix H) and the BMPs for soils and minerals (Gold Book) would be employed. While some riparian resources could be removed in the course of such construction, the extent of the impact would be minimized using these measures.

Existing mineral withdrawals along the Colorado, Dolores, and Green Rivers would be continued under all alternatives, providing an additional level of protection for riparian resources by excluding them from the adverse impacts of locatable mining operations. The application of a no surface occupancy stipulation for all surface disturbing activities to these areas under all alternatives would further protect riparian resources along these major river courses from potential adverse impacts associated with surface disturbance (e.g., vegetation degradation and introduction of noxious weeds). This stipulation would leave the riparian vegetation intact.

4.3.11.5 Impacts of Non-WSA Lands with Wilderness Characteristics Decisions on Riparian Resources

In general, managing non-WSA lands to maintain their wilderness characteristics would be beneficial to riparian resources by applying NSO or closed stipulations to oil and gas leasing and precluding all surface disturbing activities, limiting travel to designated roads, and allowing no new ROWs. NSO stipulations and precluding surface disturbing activities would prevent impacts and habitat disruption that could result from surface disturbing activities in and adjacent to riparian areas. Limitations on travel and new ROWs would beneficially reduce disturbances associated with stream crossings and off-road travel, resulting in no damage to, or removal of, riparian vegetation.

Alternatives A and D would be the least protective of riparian resources, since they would not manage areas within the MPA to maintain wilderness characteristics. Alternative B would be the most protective since 266,485 acres would be managed to maintain wilderness characteristics. Alternative C, which would manage 47,761 acres to maintain wilderness characteristics, would have intermediate impacts on riparian resources.

4.3.11.6 Impacts of Recreation and Travel Decisions on Riparian Resources

Recreation management decisions affecting riparian resources include the number of acres managed as SRMA (specifying controls on recreation use, including controls on camping and campfires), limitations on the number of river users and their duration of use, and restrictions on OHV use and travel. See Table 4.72 for acreage of SRMA by alternative. Each of these limitations generally would reduce direct, adverse impacts to riparian resources by reducing the disturbance of riparian vegetation and streambanks, the spread of noxious weeds, soil compaction, and the potential for impacts due to human-caused fire.

Table 4.72. Acreage Managed as SRMA, by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Acreage managed as SRMA	141,234	976,173	658,642	277,471
Percentage of MPA managed as SRMA	8%	54%	36%	15%

User numbers and OHV use decisions vary by alternative. Table 4.73 outlines the approximate amount of riparian area open and closed/limited to OHV use under the travel plan. The impacts of limiting OHV use to designated roads and trails would be the same as closure of riparian areas to OHVs.

Table 4.73. Acres of Riparian Areas, by OHV Area Designation, by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Acres Open	2,100	0	0	0
Acres Closed or Limited	11,350	13,450	13,450	13,450
Total	**13,450**	**13,450**	**13,450**	**13,450**

4.3.11.6.1 ALTERNATIVE A

Among the alternatives, Alternative A would provide the lowest level of management for recreation resources and, thus, the least amount of protection for riparian resources. Most of the MPA would be managed as an Extended Recreation Management Area (ERMA), which allows for only minimal restrictions on recreation use, rather than as SRMAs with provisions for controlled recreation use (141,234 acres, or 8% of the MPA, would be managed as SRMA under Alternative A). In addition, allowable river-user numbers would remain at current level. This management decision would result in adverse impacts to riparian resources, of the forms described above, as recreation users would impact riparian resources through unrestricted camping and other activities.

Approximately 2,100 acres of riparian resources would be open to OHV use under Alternative A, which represents 16% of the total riparian acreage within the MPA (see Table 4.73). Of all the alternatives, this management decision allows for the greatest potential adverse impacts to riparian resources as riparian vegetation would be destroyed by vehicles.

4.3.11.6.2 ALTERNATIVE B

Among the alternatives, Alternative B would manage 976,173 acres as SRMA (54% of the acreage in the MPA) and would provide the most intensive management for recreation use, and provide the most protection for riparian resources Alternative B would be most restrictive of user numbers on the Colorado and Dolores Rivers. River user decisions under Alternative B would therefore be beneficial to riparian resources by reducing the human imprint upon them, as compared to Alternative A, and would be the most protective to riparian resources of all the alternatives.

OHV use and camping would be limited to designated areas outside the riparian areas across most of the MPA, providing an increased level of protection from human disturbance for riparian resources, compared to Alternative A (see Table 4.73). This amounts to a beneficial impact to riparian resources compared to Alternative A because of the lack of recreation rules under Alternative A.

4.3.11.6.3 ALTERNATIVE C

Alternative C would manage 658,642 acres as SRMA, providing management for recreation use (and protection of riparian resources) on 36% of the acreage in the MPA. Alternative C would allow more visitors per day in the Colorado and Dolores River SRMAs than Alternative B, but

fewer than Alternative A. Therefore, Alternative C's adverse impacts to riparian resources from human use along the river corridors would be greater than under Alternative B but less than under Alternative A.

OHV use impacts would be the same as under Alternatives B and D (see Table 4.73). However, camping would be more limited under Alternative C than under Alternative A or D, and therefore it would have slightly more beneficial impacts on riparian resources protected from camping and campfires. Overall, Alternative C would provide more protection for riparian resources than either Alternatives A or D, and provide less protection than Alternative B.

4.3.11.6.4 Alternative D

Alternative D would manage 277,471 acres as SRMA, providing management for recreation use on 15% of the acreage in the MPA. More visitors would be allowed in the Colorado and Dolores River SRMAs under Alternative D than under Alternatives B or C, but fewer than under Alternative A. Therefore, this management decision would have a greater adverse impact on riparian resources by increasing human use along the river corridors than Alternatives B or C, but a lower adverse impact than Alternative A.

OHV use impacts under Alternative D would be the same as under Alternatives B and C (see Table 4.73).

4.3.11.7 Impacts of Riparian Management Decisions on Riparian Resources

4.3.11.7.1 Impacts Common to All Alternatives

Adherence with the Utah BLM Standards for Rangeland Health under all alternatives would promote the maintenance and restoration of the 13,450 acres of riparian resources in the MPA. Standard 2 states that "riparian and wetland areas [must be] in properly functioning condition (PFC). Stream channel morphology and functions [must be] appropriate to soil type, climate, and function" (BLM 1997a). Under all alternatives, the BLM would develop monitoring and management strategies and restrictions as necessary to maintain or restore PFC, which would benefit riparian resources by ensuring that all stream corridors meet PFC criteria.

Pipelines crossing perennial, intermittent, and ephemeral streams would be constructed to withstand 100-year floods under all alternatives (see Appendix H). This would minimize the likelihood of breakage and subsequent contamination of riparian areas during high flow events. Each surface crossing would be constructed at a height adequate to remain above peak flows. Each subsurface crossing would be buried deeply enough to remain undisturbed by scour throughout peak flows. These stipulations would minimize adverse impacts to riparian resources resulting from unrefined petroleum or hazardous substance release and/or flood flow obstruction.

No new surface-disturbing activities would be allowed within active floodplains or within 100 m of riparian areas. Therefore, mineral activities in riparian areas and 100-year floodplains would not occur under any of the alternatives, thereby limiting the potential for adverse impacts to riparian resources from mineral development.

Under all alternatives, the MFO would also comply with the Colorado River Salinity Control Act and with Utah's state water quality standards. Activities within the MPA would be managed to minimize and mitigate damage to soils, to maintain and/or restore overall watershed health, and to reduce erosion, stream sedimentation, and salinization of water. These reductions and minimizations would limit short- and long-term adverse impacts to riparian resources by helping to maintain and restore overall watershed health. Riparian vegetation, as an integral part of a watershed's ecosystem, would benefit directly (through less saline water) and indirectly (through maintenance of a naturally stable stream channel) from these management actions.

Riparian areas would be excluded from public, commercial and private harvest of woodland products under all alternatives, except for Native American ceremonial purposes. Prohibiting woodland harvest would benefit riparian resources by limiting adverse impacts from vegetation disturbance, stream bank trampling, and the introduction/spread of noxious weeds during public access. Mechanical and other vegetation removal practices—for habitat, range, and watershed improvements—would be allowed and have been evaluated in the 1991 Vegetation EIS (BLM 1991a). Riparian areas would be protected against surface disturbance by mechanized or motorized equipment and from structural development under all alternatives.

Under all alternatives, requirements for the control of invasive and non-native weed species would minimize their introduction and spread in riparian areas, which would benefit the PFC of native riparian vegetation by reducing competition with invasive species. The MPA would reduce tamarisk where appropriate using allowable vegetation treatments. These actions would reduce and/or prevent adverse impacts to riparian resources from noxious weeds.

4.3.11.7.2 Impacts Varying by Alternative

Riparian management decisions that vary by alternative include limitations on livestock grazing in riparian areas and the development of Watershed Management Plans (WMPs). Each alternative limits grazing in different allotments and areas of the MPA and prioritizes different watersheds for the development of WMPs.

These management actions are considered not only riparian management actions, but also livestock management and soil and water management actions, respectively, and represent one set of impacts each. To avoid duplication, the impacts of grazing restrictions in riparian areas upon riparian resources are considered in Section 4.3.11.3, and the impacts of WMPs upon riparian resources are considered in Section 4.3.11.8.

4.3.11.8 Impacts of Soils and Water Resource Decisions on Riparian Resources

Under all alternatives, prohibiting surface-disturbing activities within 100-year floodplains would have a beneficial impact on riparian resources in the MPA; it would reduce the disturbance of riparian vegetation and soils and the introduction and establishment of weeds on floodplains.

The prioritization of Watershed Management Plans (WMPs) and riparian studies would vary among alternatives. In general, the development of WMPs and riparian studies would have beneficial impacts on riparian resources by:

- better integrating riparian management with watershed-wide management practices, which would improve the success of riparian management activities; and
- providing better information and data, which would enhance the BLM's ability to adaptively manage riparian resources.

4.3.11.8.1 ALTERNATIVE A

Because no Watershed Management Plans (WMPs) or riparian studies are mandated under Alternative A, this riparian management decision would result in no impacts to riparian resources.

4.3.11.8.2 ALTERNATIVE B

Seventeen watersheds would be chosen for development and implementation of Watershed Management Plans (WMPs) and riparian studies under Alternative B, the most of any alternative. Thus, Alternative B would have the greatest beneficial impact to riparian resources resulting from this management decision.

4.3.11.8.3 ALTERNATIVE C

Eight watersheds would be chosen for development and implementation of WMPs and riparian studies under Alternative C: fewer than under Alternative B, but more than under Alternatives A and D. Thus, Alternative C would have greater beneficial impacts to riparian resources resulting from this management decision than Alternatives A and D, but less beneficial impacts than under Alternative B.

4.3.11.8.4 ALTERNATIVE D

Impacts would be the same as under Alternative A because no WMPs would be prepared.

4.3.11.9 IMPACTS OF SPECIAL DESIGNATIONS DECISIONS ON RIPARIAN RESOURCES

Special designations decisions affecting riparian resources would include: (1) the designation of ACECs with management prescriptions protective of riparian resources, such as restrictions on dispersed camping and on surface disturbing activities in riparian areas and (2) determinations that river segments are suitable for Wild and Scenic River (WSR) designation.

- The impacts of ACEC designations on riparian resources would depend upon each potential ACEC's management prescriptions and are, therefore, discussed under each alternative, below.
- WSR designation would require that a river's "free flowing character" be maintained, and would prohibit activities that impact the "outstanding and remarkable values" of a river.

Thus, any WSR designation would provide an increased level of protection for the given segment and would indirectly benefit riparian resources along that segment through the maintenance of the river's natural structure and ecosystem characteristics. It should be noted that riparian corridors would already be protected by the BLM National Riparian Policy and other stipulations proposed in this RMP. However, WSR designations may offer protections to those areas outside the riparian corridor but within the 1/4 mile of centerline of the river segment.

4.3.11.9.1 ALTERNATIVE A

Under Alternative A, only the Negro Bill ONA (1,375 acres), a riparian corridor, would be designated. No ACECs would be designated under this alternative. No river segments would be determined suitable for WSR designation. Six segments of the Colorado and Dolores Rivers would remain eligible and would be managed to protect their ORVs, free-flowing nature, and tentative classification. This could offer some protections to riparian resources for those segments. Beneficial impacts associated with ONA designation would occur on only 1,375 acres and decisions on WSR suitability would not be made.

4.3.11.9.2 ALTERNATIVE B

Alternative B, the designation of the Mill Creek Canyon ACEC would benefit riparian resources, as it would exclude livestock grazing and prohibit campfires in its riparian areas and maintain a 3-cfs base flow in the South Fork of Mill Creek below the Sheley Diversion. This ACEC designation would reduce the adverse impacts of livestock grazing on riparian areas (in the forms described in Section 4.3.11.3.2) and reduce the risk of human-caused wildfire in riparian areas.

Under Alternative B, the designation of the Ten-Mile Wash ACEC would benefit riparian resources by prioritizing the ACEC for riparian restoration. The ACEC would also prohibit camping in riparian areas, which would limit human disturbance of vegetation and the risk of human-caused weed invasion and fire.

In addition, under Alternative B, designation of ACECs and the resulting no surface occupancy stipulation would protect riparian areas from destruction in the following ACECs: Colorado River Corridor, Behind the Rocks, Bookcliffs, Colorado River Corridor, Cottonwood-Diamond, Highway 279/Shafer Basin/Long Canyon, Labyrinth Canyon, Upper Courthouse, Westwater Canyon, and White Wash.

Alternative B would recommend 71,300 acres as suitable for some level of WSR designation, which would protect riparian vegetation within that area.

Thus, special designations decisions under Alternative B would provide more protection and benefits for riparian resources than Alternative A, as more riparian areas would be protected in Alternative B.

4.3.11.9.3 ALTERNATIVE C

Impacts from ACEC designation to Mill Creek Canyon and Ten Mile Wash would be the same as under Alternative B. Under Alternative C, designation of ACECs and the resulting no surface occupancy stipulation would protect riparian areas in the following ACECs: Behind the Rocks, Cottonwood-Diamond, and Highway 279/Shafer Basin/Long Canyon.

Alternative C would recommend 41,236 acres as suitable for some level of WSR designation, which would protect riparian vegetation within that area. Thus, Alternative C would be less protective of riparian resources than Alternative B, but more protective than Alternatives A and D.

4.3.11.9.4 ALTERNATIVE D

Impacts from ACEC designation would be similar to Alternative A, although 1,375 acres of the Negro Bill ONA would not be designated. All river segments (other than Salt Wash) would be listed as "not suitable" for any WSR designation. Therefore, Alternative D provides the lowest level of protection of riparian resources.

4.3.11.10 IMPACTS OF SPECIAL STATUS SPECIES DECISIONS ON RIPARIAN RESOURCES

Special status species management decisions would protect and/or enhance riparian resources under all alternatives. Recovery plans for the southwestern willow flycatcher, Colorado River fishes, bald eagle, and western yellow-billed cuckoo would benefit riparian resources via riparian habitat enhancement. The removal of invasive tamarisk for restoration or enhancement of these and other special status species' habitat would generally benefit riparian resources.

Under all alternatives, special status species management decisions would avoid further loss of cottonwood gallery riparian habitats and would eliminate surface disturbance in riparian areas to protect bald eagle roosting areas. Any disturbed riparian vegetation would be replaced with native species or ecological equivalents in all special status species use areas. These actions would help maintain existing riparian resources.

All alternatives would also impose year-round restrictions on surface-disturbing activities within 300 feet of suitable habitat for southwestern willow flycatcher and western yellow-billed cuckoo—species that primarily use riparian areas for all life phases. Restrictions on surface disturbance would reduce potential disturbance or removal of riparian vegetation and soils and the introduction of invasive weeds. The eradication of tamarisk would create short-term surface disturbance but would result in long-term enhancement of riparian resources.

All alternatives would also avoid loss of riparian habitats in designated critical habitat areas of endangered Colorado River fishes. Preserving riparian habitats along these drainages would prevent sedimentation and changes in water quality.

4.3.11.11 Impacts of Vegetation Decisions on Riparian Resources

Under all alternatives, vegetation treatment decisions would reduce the prevalence of invasive Russian olive and tamarisk throughout the MPA and replace them with native willow and cottonwood stands. This would have a beneficial impact of unknown magnitude on riparian areas (depending on the success and extent of the treatments), as it would restore their native ecosystem characteristics.

4.3.11.12 Impacts of Wildlife Decisions on Riparian Resources

4.3.11.12.1 Impacts Common to All Alternatives

- Implementation of the revised Dolores Triangle Management Plan would improve riparian habitat through the installation of fencing and exclosures in Granite, Coates, Ryan, and Renegade Creeks. This decision would prevent livestock from trampling riparian vegetation and carrying weed species into riparian areas, and it would prevent sedimentation and loss of soils.
- Impacts resulting from limitations on livestock grazing to benefit wildlife would be the same as those described in Section 4.3.11.3.

4.3.11.12.2 Impacts Common to All Action Alternatives (B, C, and D)

- Restrictions on camping in riparian areas to protect wildlife habitat under all alternatives, including prohibition and restriction to designated areas, would benefit riparian resources by reducing vegetation and soil disturbance and the human spread of invasive weeds.
- Management of migratory bird habitat would prioritize the maintenance and/or improvement of lowland riparian areas, which would have a beneficial impact of unspecified magnitude on those riparian resources.

4.3.11.13 Impacts of Woodlands Decisions on Riparian Resources

All alternatives would prohibit public fuelwood gathering from riparian areas. This decision would have beneficial impacts on riparian resources by preventing disturbances and weed introduction associated with public access for fuelwood gathering.

Under all alternatives, woodland management would allow sustainable harvest of willows and cottonwoods from riparian areas for Native American ceremonial purposes. This decision would have adverse, but negligible impacts on riparian areas due to the minimal removal of vegetation and associated disturbances.

4.3.11.14 Summary of Impacts

In general, Alternatives A and D would be the least protective of riparian resources, and would prioritize the least riparian area for restoration and enhancement-focused management. Alternative B would be the most protective by excluding the most areas from grazing, and prioritizing the most WMPs and riparian studies. It would therefore provide the greatest

beneficial impacts and greatest reduction of past cumulative impacts on riparian resources. Alternative C would provide an intermediate level of protection and restoration.

Table 2.2 (located in Chapter 2) summarizes the impacts to riparian resources due to the management decisions of applicable resources under each alternative.

4.3.12 SOCIOECONOMIC RESOURCES

This section discusses impacts to socioeconomic resources from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning socioeconomic resources are described in Chapter 3.

Grand County, Utah is entirely within the MPA, with approximately 1,500,000 acres of BLM land. In addition, approximately 300,000 acres of San Juan County fall under the jurisdiction of the Bureau of Land Management's MFO, comprising the entire northeast third of San Juan County. Therefore, land management decisions made in the MPA could have a potential impact on the socioeconomics of both Grand and San Juan counties. The following socioeconomic impact analysis includes Grand County as well as San Juan County where appropriate.

Implementation of any of the alternatives likely would result in impacts to the social and economic conditions of Grand and San Juan Counties. While the range of these socioeconomic impacts may vary depending on the alternative implemented, some land management actions would have greater impacts than others, and these are disclosed in the following analysis.

Potential economic impacts include changes in employment and income; changes in tax revenue for local, state, and Federal governments; and changes in the demand for housing and public service. Quantitative data was used to analyze these economic impacts, where available. Where quantitative data are not available, a qualitative analysis is performed based on the best available information.

Social impacts to communities cannot be measured in economic terms except to the degree that economic problems (e.g., unemployment) may lead to social problems (e.g., divorce, substance abuse, crime, etc.). Human impacts that are difficult to quantify include enhancements to or detractions from existing lifestyles, sense of place, and community values, and disproportionate impacts on low-income or minority populations. Accordingly, these impacts are assessed qualitatively.

Impacts to socioeconomic from implementation of alternatives would be considered significant if one or more of the following occurs and is attributable to the implementation of alternatives:

- Substantial gains or losses in population/employment
- Substantial alterations in the lifestyles or quality of life of individuals who use or inhabit the MPA.
- Disproportionately adverse changes to environmental or human health within an identified minority or low-income population

4.3.12.1 Impacts Common to All Alternatives

4.3.12.1.1 Environmental Justice

Executive Order (EO) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, requires that disproportionately high and adverse human health and environmental impacts of Federal programs, policies, and activities to minority or low-income populations be identified and addressed.

For each alternative, it has been determined that BLM resource management actions within the MPA would not result in disproportionate effects to "environmental justice populations" as defined in Executive Order 12898. Minority and low-income populations do exist in the MPA, but none of the proposed alternatives for BLM action would cause disproportionate adverse impacts to these populations in comparison to the general population.

4.3.12.1.2 PILT (Payments in Lieu of Taxes) Program

None of the alternatives would result in significant changes in Federal ownership in the MPA. Any future land exchanges or sales would be assessed to determine specific impacts, but, in general, actions proposed with the Draft RMP/EIS would not change payments to Grand and San Juan Counties made under the PILT program according to established formulas.

4.3.12.1.3 Population

Population changes in Grand and San Juan Counties that could be associated with the implementation of any of the alternatives considered in this EIS would likely be linked to employment changes. Activities such as livestock grazing and mineral development within the MPA that support jobs in the area are not expected to increase or decrease substantially under any of the alternatives (see impacts analysis below for further details). Therefore, it is not likely that BLM-related management decisions (apart from recreation decisions that could increase revenues to recreation-based businesses) would result in significant changes to current population trends (see Section 3.12.4.2.1 for local population data).

4.3.12.2 Alternatives Impacts

4.3.12.2.1 Impacts of Air Quality Decisions on Social and Economic Conditions

None of the decisions concerning air quality are expected to adversely affect the social or economic conditions of Grand and San Juan counties.

4.3.12.2.2 Impacts of Cultural Resource Decisions on Social and Economic Conditions

The MPA has approximately 5,200 inventoried cultural sites. Cultural sites draw recreationists to the area. Increases or decreases in access to sites as well as changes to the quality of the sites have the potential to impact visitor experience and local revenues.

Cultural resource management decisions could increase or decrease recreational visits to the sites, as well as influence the overall visitor experience. The level of impacts is related to several factors including 1) the importance of the sites to Native American communities in the area (the historic cultural sites in the area serve as a connection between the landscape and the local tribes' respective heritages), 2) any links between local residents and cultural sites, and 3) the degree to which specific sites draw visitors to the area.

Potential economic impacts resulting from cultural resource management decisions could include an increase or decrease in visitor spending. Increasing access could increase visitor spending in the area in the short term, but degradation to sites could lead to long-term adverse economic impacts, as visitors may choose not to return to the area. For the purposes of this analysis, it is suggested that a greater emphasis on restoration, preservation, and inventories of cultural sites within the MPA would maintain and/or enhance recreationists' experience, leading to greater long-term beneficial impacts to socioeconomics.

4.3.12.2.2.1 Alternative A

Under Alternative A management of cultural sites would continue as it currently exists. No prioritizations would be made for field inventories, scientific restoration, public interpretation of sites, or nomination of sites to the National Register of Historic Places. The social and economic conditions resulting from the presence of cultural sites in the area would remain the same.

4.3.12.2.2.2 Alternative B

Alternative B offers the most protective plan for cultural resources within the MPA, because it would place greater restrictions on surface-disturbing activities such as mineral development, recreation use, and OHV travel. Additionally, it would provide more special designations, which, in turn, would reduce the possibilities for inadvertent adverse impacts to cultural resources. Alternative B also provides a proactive approach to cultural resources through the development and implementation of integrated cultural-recreational management plans.

Long-term beneficial impacts to local economic conditions resulting from cultural resource management decisions would be greatest under Alternative B. The identification, preservation, and restoration of sites within the MPA would attract the greatest number of visitors interested in the area's cultural history. Economic contributions to local towns from these visitors would be greatest under this alternative.

The social benefits resulting from cultural resource management decisions such as visitor experience, Native American connections to historic sites, and social connections that tie the landscape to a rich cultural history would be greatest under Alternative B. The long-term social benefits would be directly related to the restrictions on surface-disturbing activities, the opportunities for public interpretation, and the implementation of cultural-recreational management plans.

Revenue generated from cultural resource-related tourism and the historical and social connections would likely be greatest under Alternative B; however, impacts resulting from

cultural resource management decisions could also have some adverse economic impacts to the area. By restricting surface disturbing activities, such as mineral development and OHV travel, the revenue typically generated from these activities could be less under Alternative B in comparison to other alternatives.

4.3.12.2.2.3 Alternative C

Alternative C would provide the next-greatest benefit to socioeconomics from cultural resource management decisions, as it provides slightly fewer prioritizations that would reduce opportunities for adverse impacts to cultural resources compared to Alternative B. The prioritizations would lead to long-term beneficial economic impacts resulting from resource-related tourism.

Because Alternative C allows for fewer restrictions that limit surface disturbing activities, compared to Alternative B, opportunities for mineral development and OHV travel would be greater, thus allowing communities to generate revenue resulting from these activities. However, it is impossible to predict whether tourist-generated revenue would exceed commodity-based losses or revenues.

4.3.12.2.2.4 Alternative D

Alternative D would provide the fewest socioeconomic benefits from cultural resource management decisions in the MPA. Alternative D opens the most acres to surface-disturbing activities, and, therefore, the potential for degradation of cultural resources sites would be highest. However, more opportunities for surface-disturbing activities would allow for more revenue generation from these activities and thus short-term beneficial economic impacts to local communities.

4.3.12.2.3 Impacts of Fire Management Decisions on Social and Economic Conditions

Impacts of fire management decisions on social and economic conditions would be the same for all alternatives. During a normal fire year the Moab Fire District averages 100 wildfires resulting in 10,000-16,000 acres of burned land. The Moab Fire District encompasses the Monticello, Moab, and Price Field Offices. Most fire activity occurs in the eastern half of the district, including the area of the MPA, although fires can occur in almost all areas of each field office. In the twenty-five-year period between 1980 and 2005, approximately 74% of wildland fires occurring in the Moab Fire District were lightning-caused. Prior to 1995, an average of 100 fires per year burned an average of 10,000 acres. The past decade has shown a trend of increasing wildland fire, with an average of 130 fires each year burning an average of 16,000 acres. In the MPA specifically, over this 10-year period, an average of 4,000 acres were burned each year (personal communication between Dave Engleman, FMO MPA and Laura Burch, SWCA October 31, 2006). This annual average does not include the Diamond Creek Fire that burned approximately 90,000 acres in 2001. See Section 3.4 for further fire management details.

In the upper Snake River Plain, which has similar vegetation types as the Moab Fire District, the average cost of wildland fire treatment was estimated to be $105 per acre. The average cost for wildland fire suppression was estimated to be approximately $140 per acre (BLM 2006b). Based on an average of 4,000 acres burned per year in within the MPA, the annual cost to suppress fires would be an estimated $560,000. The cost of fighting fires, including supplies and labor, has the potential to impact local economies.

Of the total expenditures for the fire management program, the following are estimates of percentages spent in each category.

- 45% variable costs
- 30% fixed labor costs
- 25% other suppression costs (BLM 2006b)

Increased fire treatment and suppression could lead to more seasonal jobs in the region, since more firefighters would be needed during fire season. The fixed labor costs for suppression (see above) would be funneled back into the community as the firefighters are generally employed locally and thus contribute to the local economy. Areas of the economy that are boosted by the variable costs for treatment and suppression include fuel, food, lodging, maintenance, vehicles, administration, aviation, warehousing, and seeding.

It should be noted that the expenditures related to fire management within the Moab Fire District are made on an inter-agency basis and do not solely rely on BLM funding. Other agencies involved in management activities are the Bureau of Indian Affairs; Utah's Forestry, Fire, and State Lands office; the U.S. Forest Service; the National Park Service; and the U.S. Fish and Wildlife Service. Funding for treatment and suppression of fires within the MPA are often out of BLM control and therefore out of the scope of this RMP. However, by looking at the expenditures for fire management on an annual basis, specifically the variable and fixed labor costs, fiscal impacts to local communities can be estimated.

Full suppression of increasingly larger fires could result in adverse fiscal impacts to affected agencies and local volunteer fire departments. If future demands for fire-fighting services cannot be met by current staffing levels and budgets, the MFO and other agencies that help fight BLM fires would be adversely impacted. Local governments may be required to expend money to fight larger fires.

It should be noted that wildfire treatment, such as actively managing lands to reduce fuel loads, is less costly to agencies than fire suppression ($105 per acre vs. $140 per acre). Expenditures for fuels treatments in the Moab Fire District (MFD), however, are currently paid almost exclusively to out-of-area contractors, providing only marginal direct economic benefits to the local economy (personal communication between Bill Stevens, MFO, and Brain Keating, MFD fuels specialist, on June 27, 2007). Actively managing BLM lands to reduce fuel loads would potentially provide economic benefits associated with the reduced risk of large-scale fires that could damage personal property (e.g., homes) and fewer expenditures on fire suppression.

Homes and structures that are located within areas faced by threat of wildfire are becoming increasingly susceptible to wildland fire; with that comes an accompanying risk to lives and property. Communities in need of management to reduce the threat from wildland fire on adjacent public lands are identified as wildland-urban interface areas, or "WUIs." WUIs presently recognized within the MPA include the communities of Brown's Hole, Castle Valley, Dewey, La Sal and Old La Sal, Moab and Spanish Valley, Pack Creek, Thompson Springs, Willow Basin, and Wilson Arch. Treatments to reduce fuel loads in these areas would potentially have long-term beneficial impacts on these communities because risk of damage to property is decreased. If there is a reduced risk of large-scale fires in WUI areas, people may be more likely to remain in these areas, and individuals interested in remote locations for primary or secondary homes could be more likely to build in these areas, thus maintaining or increasing the populations of local communities.

4.3.12.2.4 Impacts of Health and Safety Management on Social and Economic Conditions

For all of the alternatives, health and safety management actions that would identify and address safety concerns about abandoned minelands, respond to hazardous waste releases, and protect public health and safety would have negligible adverse impacts to social and economic conditions of Grand and San Juan Counties because no local expenditures would be required. Long-term beneficial impacts to socioeconomics would likely result with the reclamation of abandoned mine land, as the lands would be safer to recreate on and improved soils and habitats could contribute to a positive visitor experience. The hazard management restrictions would not interfere with or restrict the local economy, government revenue, or the local social character of the two counties.

4.3.12.2.5 Impacts of Lands and Realty on Social and Economic Conditions

For all of the alternatives, management decisions regarding access to, permits for, transfer of, acquisition, or exchanges of lands within the MPA would have negligible adverse impacts on socioeconomics in Grand or San Juan Counties. Filming permits, which authorize local revenue-generating activity, would be granted under all alternatives provided they meet the criteria outlined in Table 2.1, Lands and Realty, Actions Common to All. Wind and solar energy and communication sites, R&PPs and utility lines throughout the MPA would be considered under all alternatives

4.3.12.2.6 Impacts of Livestock Grazing on Social and Economic Conditions

There are a total of 83 allotments within the MPA boundaries; 74 are administered by the MFO, and 68 are currently permitted for livestock use. Total BLM acres within allotments equal 1,794,798 acres; of these, 1,706,171 acres are currently permitted for livestock use.

Economic benefits associated with livestock grazing in the MPA are associated with income and employment generated by ranching operations on BLM lands. Indirect economic benefits are related to secondary jobs, income, and sales and income taxes.

A decrease in the number of acres available for grazing has the potential to adversely impact the lifestyle of ranchers. Losses in grazing opportunities could result in lost income and consequently a decline in social well being for affected ranchers and their families. The inability for ranchers to continue with traditional practices could potentially impact the overall character and way of life for residents of Grand and San Juan Counties.

However, it is important to note that the majority of grazing permittees within the MPA do not reside within the MPA. Therefore, contributions from these ranchers to the local economy could be minimal since supplies and materials are often purchased outside of the Grand and San Juan County communities. According to BLM records, of the 42 grazing permittees in the MPA, 15 live within the MPA (BLM 2006a).

Reductions in ranching-based income could make it more difficult for families to earn a living on ranching alone. Family members may have to get second jobs or work off the farm to bring in additional income. If ranchers are unable to continue operations, effects to local communities could include loss of business activity and/or the businesses themselves, and a decline in population if individuals have to relocate to earn a living. The positive direct and indirect economic impacts associated with livestock grazing (such as income, employment, sales, and income tax) would continue under all four alternatives. Due to the slight variation among alternatives in the acres and AUMs available for grazing (see Table 4.74), socioeconomic impacts would resemble current conditions regardless of the alternative selected. Because the acreage available for grazing differs by no more than 101,582 acres (out of 1,822,528 acres) across alternatives, it is unlikely that the lifestyle enjoyed by the local ranching community would be adversely impacted in the short-term or long-term. Approximately 77,256 acres are not available to grazing in the No Action Alternative (A); as a result, current livelihoods would not be affected. However, under Alternative B two allotments currently available for grazing would not be available. This could have adverse impacts on the permittee holding the allotments. In addition it should be noted that of the 153,797 acres under consideration for closures under Alternative B 126,907 acres are currently unavailable and were not available for grazing under the Grand RMP. Furthermore, impacts to local economic conditions would be minor because only a minority of grazing permittees live within the MPA and therefore they may not contribute substantially to the local economy.

Table 4.74. Livestock Grazing Acres Available per Alternative

	Alternative A (No Action)	Alternative B	Alternative C (Preferred)	Alternative D
Acres Available	1,695,621	1,668,732	1,708,294	1,770,314
Acres Unavailable	126,907	153,797	114,234	52,214
AUMs available	107,071	106,437	107,179	108,876

4.3.12.2.7 Impacts of Minerals on Social and Economic Conditions

4.3.12.2.7.1 Locatable Minerals

Uranium

As mentioned in Section 3.12.1.5.7, recent increases in the price of uranium have led to a substantial increase in the filing of uranium claims within the MPA. Between FY 2004 and FY 2006, 4,242 mining claims were filed within the MPA. While the exact percentage of uranium claims versus other locatable mineral claims is not known, it is likely that the majority of the claims filed were for uranium. In addition, the Mineral Potential Report (MPR) indicates a high potential for the occurrence of uranium in the La Sal and Lisbon Valley areas. Should extraction occur, the majority would take place on BLM land. While the increase in the filing of mining claims does not necessarily predict future development, any extraction activities would have beneficial impacts on local economic conditions, as developers would require goods and services in nearby towns. The number of acres open to uranium extraction is identical under Alternatives A, B, C and D, and represents no change from the current condition. Therefore, potential adverse impacts (i.e., restricting the number of acres open to extraction) would be negligible under all alternatives.

Other Locatables

As in the case of uranium, the extraction of other locatables such as copper, placer gold, and limestone would not be adversely impacted regardless of the alternative selected. This is due to the large number of acres open to extraction under all alternatives and the small amount of mining that is likely to take place.

The newly opened Lisbon Valley Copper Mine, located within the MPA, would continue operations under all alternatives. Contributions to the social and economic conditions in Grand and San Juan Counties from employment, property taxes (the mine is located partially on private land as well as BLM land), and indirect retail goods and services would continue regardless of the RMP alternative selected.

Salable Minerals

Sand, gravel, building stone, and clay have a high potential for occurrence, and extraction of these minerals would likely occur throughout the life of the RMP regardless of the alternative selected. Minor—or even negligible—impacts to socioeconomics would be likely since the operations are typically small, and the number of acres open to extraction would likely be adequate to accommodate demand. Alternative B has 808,097 acres open to development of salable minerals while the other three alternatives have over 1.2 million acres available. Under all alternatives, these acreages should be sufficient to meet demand for salable minerals (see Section 4.3.7.2 for exact acreages).

4.3.12.2.7.2 Leasable Minerals

Potash and Salt

Under all alternatives, the same minimum amount of potash and salt development would be expected. The expected level of development would not appreciably contribute to the economy of Grand County.

Oil and Gas Development

The greatest socioeconomic impacts from minerals decisions would result from changes to the oil- and gas-leasing program that currently exists in the MPA. Because of undefined market and non-market factors, the following analysis is based on simplified assumptions used to quantify general estimates of development costs, employment, production, and production revenue. This analysis is based on the following assumptions pertaining to the number of wells drilled per year, employment, production, and fiscal impacts.

Wells Drilled Per Year

This analysis is based on an estimate of potential oil and gas wells drilled annually over the life of the plan (LOP). The number of wells drilled per year has been figured by dividing the total number of wells per alternative by the 15-yearlife of the plan. Table 4.75 illustrates the annual well potential per alternative.

Table 4.75. Summary of Well Potential and Acres Open to Leasing on BLM Land per Alternative

	Predicted Wells			
	Alternative A	Alternative B	Alternative C	Alternative D
Acreage Open	1,427,949	808,097	1,234,267	1,387,473
% Of Total Acreage Open Compared to Alternative A	--	-43%	-13.5%	-2.8%
Total Number of Wells over 15 Years	451	255	432	448
Total Annual Well Potential	30	17	29	30
Total Number of Potential Oil Wells	4	2	4	4
Total Number of Potential Gas Wells	26	15	25	26

Employment

The drilling and completion of an oil well requires a crew of approximately 7 full-time employees (FTE). In addition to the crew members, several service and supply companies contribute to well development. One oil well could involve the services of up to 25 employees from drilling to completion. The majority of employees would be in the area on a short-term basis and would typically stay in a nearby hotel. Short-term construction workers may stay in on-site trailers or in local campgrounds. It is likely that the employees related to the oil and gas exploration and completion of wells within the MPA are not permanent residents of Grand or

San Juan Counties (personal communication between Jeff Brown, Monticello FO, and Laura Burch, SWCA, on August 11, 2006).

Given the number of wells predicted annually per alternative (17–30), it is reasonable to assume that 2 crews of 7 FTEs and approximately 2 groups of service professionals (or equivalent in the number of employees) would be responsible for all wells throughout completion. Because the employees responsible for drilling and completion typically do not live in the area and because the overall number of employees required to complete the initial development phases is relatively small, it is predicted that the overall contribution to employment opportunities in Grand and San Juan Counties from oil and gas development is minimal, regardless of alternative. It is not likely that the employment derived from the drilling and completion of wells in the area would positively impact poverty or unemployment rates in Grand and San Juan Counties. Employees working on-site may stay in local hotels and patronize local business while in town, thus contributing to the local economy, but these contributions would be short-term and would vary from year to year. It should be noted that many oil and gas workers live in Grand Junction, and do not spend any money in Grand County at all.

Once a well begins production (which can last up to 20 years), local employees could be employed on a long-term basis to maintain and operate the wells and to begin gradual reclamation of inactive wells and associated access roads. These oil and gas production jobs pay well (relative to other jobs within the county) and could employ up to 20-30 people over the life of the well. Because a small number of workers are needed to perform operation and oversight functions, contributions to the local economy and to overall county employment numbers are not significant. Employment related to all mining activities, including oil and gas development, only contributed 2.1% (120 jobs) to the total employment in Grand County and 5.6% (313 jobs) in San Juan County in 2000 (See Section 3.12.4.2.6).

Production

The majority of mineral development currently occurring within the MPA is natural gas production with 244 producing gas wells versus 30 producing oil wells on lands in the MPA (per Section 3.12.1.5.7, Table 3.40). Based on these numbers and historical trends, the following analysis assumes that 88% of the wells drilled in the MPA would be gas and 12% would be oil. See Table 4.75 for the number of oil and gas wells per year per alternative.

According to the Energy Information Administration, in January 2007 current-day oil price was $56.29 per 42-gallon barrel (EIA 2007). In 2004, the average yearly production per oil well in Utah was 7,141 barrels of oil. Potential annual revenue per oil well is $401,966 assuming that 7,141 barrels are recovered (7,141 × $56.29). The life of each well is estimated to be 15-20 years. The rate of production per oil well declines approximately 10% per year after the initial year. Therefore, annual revenue per well would begin at $401,966 and decrease 10% per year throughout the life of the well.

As of December 2006, the current natural gas price according to the Energy Information Administration was $6.65 per thousand cubic feet (MCF) for natural gas (EIA 2007). In 2004, the average yearly production per gas well in the state of Utah was 75,153 MCF (EIA, 2007), although gas wells in Grand County produce below the state-wide average. For analysis

purposes, potential annual revenue per natural gas well is assumed to be at the state-wide average of $499,767 (75,153 × $6.65). The life of each well is estimated to be 20 years. The rate of production declines approximately 10% per year after the initial year, according to the UDNR. Therefore, the recovery value would begin at $499,767 and decline 10% per year throughout the life of the well.

Fiscal Impacts

The drilling and completion of wells in the MPA would have an impact on local and state governments resulting from taxes and other revenue received. Tax and royalty revenue would be realized for the life of the well, with diminishing returns after maximum production is reached. The severance taxes and royalty revenues generated from natural resource development are dependant on the amount of the commodity produced. Given the uncertainty of the geology and the market, the quantification of revenue is speculative.

The severance taxes collected on mineral production are distributed within the state according to a formula published in state statutes. Severance tax revenues are distributed to a variety of state and local entities including the state's general fund, the state highway fund, counties, cities, and towns. Local government entities within the MPA would only benefit from a percentage of severance taxes collected on production within the study area. However, these entities would also benefit from severance taxes collected on mineral production occurring in other parts of the state (BLM 2003d).

Royalty revenue to the Federal, state, and county government equals 12.5% of production revenue. The Federal government returns 50% of the total royalties to the state where the mineral production occurs. The royalties are then distributed between the state and counties where the production takes place. Assuming the recovery value for one oil well is $401,966 per year, royalty revenues would be $50,245 per well at maximum production (401,966 × 0.125). If the recovery value for one natural gas well were $499,767 per year, royalty revenues would be $62,470 per well at maximum production ($499,767 × 0.125). The State of Utah receives 50% of this royalty payment, or $31,235 per gas well and $25,122 per oil well.

In addition to royalty revenue, developers pay several taxes that benefit state and local governments, including severance, conservation, mineral withholding, and payroll taxes. In 2002 the severance tax rate for oil and gas development on Utah lands was 3% of the value up to and including the first $13 per barrel for oil, $1.50 per MCF of natural gas, plus an additional 5% of the value above these prices. The estimated ad valorem taxes for each mineral type are based on productions, assessed values, and current tax rates. Ad valorem taxes assessed on property associated with oil and gas operations generate tax revenue for the counties; with respect to this RMP, the greater the number of producing wells in the MPA, the greater the generation of property taxes associated with oil and gas extraction assets.

Bonus payments are one-time payments to the Federal government for a leased parcel of BLM land for a ten-year period that contribute to the state and local economies as a proportion of the payments are disbursed to state and local governments; these would continue under all alternatives. However, it is assumed that the more acres that are open to oil and gas development, the greater the opportunity for economic contributions from bonus payments.

Annual rental payments—$1.50 per acre for the first 5 years and $2.00 per acre each subsequent year—would also continue to contribute to state and local revenues as a proportion of the payments are disbursed to state and local governments under all alternatives. As in the case of bonus payments, annual rental payments have the potential to be greater in the future if more acres are open to mineral leasing.

As noted in Section 3.12.1.5.7, Grand and San Juan Counties receive a portion of Federal mineral lease monies returned to the State of Utah by the Federal government through the Permanent Community Impact Fund Board (CIB). The funds received by Grand and San Juan Counties for infrastructure projects would likely continue in amounts similar to recent contributions regardless of the BLM alternative selected, because CIB funding is not directly correlated with production by county but rather by applicant eligibility.

Alternative A

The number of employees needed to drill and complete the wells would remain the same. Given the historically inconsistent number of wells drilled annually within the MPA, the number of short-term employees would vary yearly. Should the maximum number of wells be drilled in a given year, it is likely that 2 crews of 7 FTEs and approximately 50 well service employees would be required. Under Alternative A (as well as all the other alternatives) the number of employees responsible for long-term production of the wells is expected to remain relatively unchanged since few local employees are required to perform maintenance and operation duties over the life of the wells. Should drilling of the actual annual well potential occur (30 wells annually) for several consecutive years, additional production employees would likely need to be hired. However the number necessary would likely be few. These additional jobs would have a minor beneficial impact to the local economy. Poverty and unemployment rates would not be positively or adversely impacted as a result of oil and gas related employment.

The annual estimated production royalty revenue from 4 oil wells would be $200,980; from 26 natural gas wells it would be $1,624,244. The range of economic contributions would vary depending on the combination of oil and gas wells that are producing annually. Assuming that producing wells occur on public lands, 50% of the production royalty revenues listed in Table 4.76 would go to the state; 10% of the royalties would go to the General Fund of the U.S. Treasury; and 40% of the royalties would to go the special purpose accounts of the reclamation fund (BLM 2005f).

Property taxes, including ad valorem taxes resulting from oil and gas development, would increase or decrease in proportion to the amount of production occurring within Grand and San Juan Counties. Overall, the contributions to the local economy from property tax and from other tax revenue generated from oil and gas extraction companies would be similar to current contributions. Annual oil and gas lease rental payments would also continue to contribute to the economy in a similar fashion under all alternatives.

Table 4.76 Annual Estimated Royalty Revenue per Alternative

	Estimated Revenue			
	Alternative A	Alternative B	Alternative C	Alternative D
Oil Wells	$200,980	$100,490	$200,980	$200,980
Gas Wells	$1,624,244	$937,050	$1,561,750	$1,624,244

*Revenue shown is at maximum production. Table does not reflect 10% annual decrease in production and therefore, revenue.

Alternative B

Government revenues in the form of taxes and production royalties from oil and gas extraction under Alternative B would be less than those under Alternatives A, C, and D given that the Alternative B's total well potential, at 255, is less (compared to approximately 450 under Alternatives A, C, and D). With annual estimated revenue at $100,460 for oil and $937,050 for gas, local economic contributions from production royalties would be less and would thus adversely impact the local economies when compared to the other alternatives. Acres open for oil and gas development would be substantially fewer under Alternative B than under the other alternatives (43% fewer than in Alternative A), giving developers fewer exploration and extraction location options within the MPA. Employment related to oil and gas development would be less under Alternative B in comparison to the other alternatives. Hiring additional employees to manage the long-term production of the wells would be the least likely under this alternative, thus allowing for less of a potential beneficial impact to the local economy in comparison to the other alternatives.

Alternative C

Government revenues in the form of royalties and taxes from oil and gas production under Alternative C would be similar to those under Alternative A, given that the total well potential between the alternatives is similar (451 under Alternative A and 432 under Alternative C). The number of acres open for oil and gas development is slightly less under Alternative C by 13.5% (see Table 4.76). Employment levels related to oil and gas development would be similar to Alternative A.

Alternative D

Government revenues in the form of royalties and taxes from oil and gas production under Alternative D would be similar to those under Alternative A, given that the total well potential between the alternatives is almost identical (451 under Alternative A and 448 under Alternative D). When compared to the No-Action Alternative, the numbers of acres open for oil and gas development is less under Alternative D by 2.8% (see Table 4.76). Employment levels related to oil and gas development would be similar to Alternative A.

4.3.12.2.8 Impacts of Non-WSA lands with Wilderness Characteristics Decisions on Social and Economic Conditions

Alternatives A and D do not propose any lands be managed for wilderness characteristics. Therefore impacts to revenues from mineral development would not be affected. However, some recreation revenues could be lost due to fewer opportunities for non-mechanized recreation in Alternatives A and D.

Alternative B proposes to manage 266,485 acres of lands to maintain their wilderness characteristics. These lands would be closed to oil and gas leasing. Under Alternative B, approximately 15.2% of all BLM lands would be managed to maintain wilderness characteristics In Alternative C, the BLM would manage 47,761 acres of lands to maintain wilderness characteristics. These 47,761 acres (2.6%) would be limited to NSO. The management of wilderness characteristics under Alternative B (15.2%) and Alternative C (2.6%) would have adverse impacts to oil and gas development and the subsequent revenue generated for the local economy, as fewer wells would be drilled, particularly under Alternative B.

Managing lands for wilderness characteristics may have some positive economic benefits to the local economy, above and beyond recreation benefits to individual users of these areas. There is an extensive body of literature which argues that protecting lands as wilderness provides local, regional and national economic benefits. A briefing paper prepared by the Wilderness Society (TWS 2004) summarizes some of the more relevant research on this topic. For example, some research suggests that private property located next to or near protected lands increases in value due to this proximity. Other research suggests that areas with protected lands are more likely to attract higher income individuals, as well as businesses, who value the types of recreation activities provided in protected areas. Still other research argues that certain types of high-dollar recreation, such as hunting, are enhanced by wilderness protection. While most of these studies have focused on the benefits accruing to designated wilderness, it is possible that the same arguments may be applicable to non-WSA lands with wilderness characteristics.

In the MPA, with its relatively large number of second homeowners, it is reasonable to expect that certain features of managing for wilderness characteristics, such as protection of visual resources, would contribute to the appeal of the area both as a second home locus and as an area in which to retire. This scenario could benefit the local economy to the extent that such newcomers spend locally on such items as housing (especially construction), financial services, and healthcare. For some current residents, however, the restrictions on mineral extraction in Alternatives B and C, with any corresponding loss in employment opportunities or local tax revenues, could pose an additional economic hardship.

In Alternatives B and C, OHV use on designated routes would be permitted on those lands with wilderness characteristics (see Section 4.3.8.2.13 for details). Thus, adverse social and economic impacts as a result of decreases in OHV use are not likely regardless of alternative selected, although greater opportunities for OHV use occur under Alternative A.

4.3.12.2.9 IMPACTS OF PALEONTOLOGICAL RESOURCES ON SOCIAL AND ECONOMIC CONDITIONS

Management actions for paleontological resources would have negligible impacts on socioeconomic resources because the recreational and scientific collection of fossils, as well as the protection of these resources would be similar to current conditions and are the same across alternatives. Personal collection of invertebrate and plant fossils would be allowed throughout the MPA. The recreational collection of vertebrate fossils, as well as of noteworthy invertebrate and plant fossils, is already prohibited within the MPA. Therefore, the recreational collection of fossils from BLM-administered lands would have minimal impacts on the local economy. The permit-required scientific gathering of fossils within the MPA occurs rarely; approximately a half-dozen permits are issued annually (See Section 3.9.3). The economic contributions, including sales and hotel tax revenue, from scientific collection would also be negligible under all alternatives.

4.3.12.2.10 IMPACTS OF RECREATION AND TRAVEL ON SOCIAL AND ECONOMIC CONDITIONS

Proposed recreation management decisions for the MPA have the potential to impact the local and regional socioeconomic conditions. The socioeconomic impacts would be primarily in the form of income and employment effects in the economies that serve the recreational user. Because the majority of recreation revenue occurs in Grand County, as do the majority of goods and services accessed by recreational users and tourists, the following analysis will not focus on the socioeconomic impacts to San Juan County. See the Monticello EIS/RMP for recreation impacts to San Juan County.

The relationship between changes in land-use decisions as they regard recreation and their associated social and economic impacts is difficult to quantify. Therefore, the following assumptions have been made:

- Increasing recreation opportunities could positively affect visitation, which could also benefit local businesses and overall traveler spending in the region.
- Improving the recreation experience would have a positive effect on the social component of recreation, potentially increasing visitation.
- Recreation Focus Areas, which would tend to segregate or concentrate specific recreational opportunities, activities, and users into spatially separate areas, would reduce recreation resource use conflicts. Focus areas are recreational management areas that would emphasize specific recreational opportunities and activities while permitting other recreational uses, in accordance with the Moab Travel Plan. It has also been assumed that a reduction in recreational use conflicts would enhance the expected recreational experiences within a particular focus area for certain user groups. Focus areas would be managed to meet the needs of specific user groups and thus the recreational experience would be more enjoyable and more likely to meet user recreation expectations. The number of focus areas within the MPA differs for each alternative. The focus areas emphasize recreational opportunities through facilities and education.
- Special Recreation Management Areas (SRMAs) are also intended to reduce user conflict as the BLM manages them more broadly for a specific recreational experience in comparison to

focus areas. Each SRMA has been previously identified as an area where recreation issues or management concerns occur. Both focus areas and SRMAs would still allow for other recreational uses within their boundaries in accordance with the Moab Travel Plan. For more information on the types of focus areas and SRMAs, see Section 4.3.10.2.10. Overall, focus areas and SRMAs would have long-term beneficial impacts on local socioeconomic conditions, because enhancing specific recreation opportunities in particular areas would likely reduce user conflict. With the reduction of user conflict in the MPA, it is likely that visitors would have a positive recreation experience and return to contribute more to the local economy.

- Specific user groups have their own sets of recreational expectations, goals, and needs. It has also been assumed that, because each user group has specific needs, goals, and expectations, each group also has recreational conditions and criteria that provide the opportunity for a satisfactory user experience. The recreation user groups and assumed conditions/criteria for satisfactory recreational user experiences are found in Section 4.3.10.

With the trend toward increased recreation within the MPA, user conflicts are likely to remain an issue regardless of the alternative selected. User groups, as defined in Section 4.3.10, include motorized (on-road), motorized (off-road), non-motorized, non-mechanized, river floating, and specialized recreation. Increases in conflicts among user groups have the potential to adversely impact visitor experience to the area. The adverse impact to visitors regarding their recreation experiences would likely be short-term. However, long-term adverse impacts to the county's economy could be possible, as users might choose to recreate in other areas where they feel they are more likely to have a positive recreation experience. This would contribute to a loss in traveler spending in the area.

4.3.12.2.10.1 Impacts Common to All Alternatives

Special Recreation Permits (SRPs) would be issued under all alternatives as a discretionary means to help meet BLM management objectives, facilitate recreational use of public lands, control visitor use, protect recreational and natural resources, provide for the health and safety of visitors, and provide opportunities for economic activity in the nearby communities. The number of land based commercial SRPs would not differ among the alternatives. Revenues generated by commercial SRPs (2006) total $6,270,676; of these revenues, $2,762,175 was generated by commercial river companies, and $3,508,501 was generated by land-based outfitters.

4.3.12.2.10.2 Impacts Common to All Action Alternatives (B, C and D)

Among all action alternatives, within SRMAs, no surface occupancy for oil and gas leasing and other surface-disturbing activities would be permitted within 0.5 miles of developed recreation sites, including current and potential future facilities. As a result, visitor experience within the SRMAs would likely be enhanced and user conflicts reduced.

4.3.12.2.10.3 Alternative A

As shown in Section 3.12.1.5.7, tourist spending in Grand County has grown consistently since the 1990s, contributing an annual average of $2 million in local sales tax revenue since 2000

(UDTD 2004). Under current management actions, recreation use is projected to continue existing trends. Visitation to local attractions would be anticipated to follow the existing growth trend. Local and regional social and economic impacts from recreation and tourism would be similar to those experienced currently.

Tourism-related spending in Grand County could total approximately $100 million dollars, as it did in 2003. Expenditures for leisure and hospitability services are taxed at the local and state level and are a benefit to counties. Under Alternative A, tax revenue from visitor spending (i.e., hotel, restaurant, and sales tax) would similarly contribute to the county's fiscal resource base.

Travel- and tourism-related employment could continue to increase according to existing trends. Recent increases in travel- and recreation-related employment in Grand County are illustrated with a jump from 1,878 to 1,999 jobs between 2000 and 2003, a 6.4% increase (UDTD 2004). Increases would reflect the trends of recent years and would have a positive impact on the local economic conditions. However, it should be noted that with increases in higher wage jobs, such as construction and infrastructure development as a result of second-home ownership in a recreational setting, lower wage service jobs could potentially become harder to fill with local residents.

Under Alternative A there would be 3 SRMAs (Canyon Rims, Cameo Cliffs, and Colorado River) totaling 135,094 acres designated, and no designation of focus areas. It is likely that user conflicts could increase as they have over recent years as more people come to the MPA for recreational purposes. User conflicts could result in adverse experiences for the users thereby decreasing the likelihood that they would return to the Moab area and patronize the local businesses, potentially a long-term adverse impact on the local economy.

Under Alternative A, 620,212 acres would be designated as open to OHV use and 1,196,920 acres would be designated as limited to Existing or designated routes. It is presumed that the number of acres available for OHV travel among all alternatives is sufficient to meet current demand (personal communication between Bill Stevens, MPA, and Laura Burch, SWCA, on November 9, 2006). However, if increased interest in OHVs continues as it has in recent years, the number of acres available under any alternative may not meet future need.

This alternative represents the current conditions for OHV access, and, as such, it is likely that the economic contributions from the user group would be similar to current contributions. Contributions to the local economy from hotel taxes, retail, maintenance, and restaurant sales would continue along the current path.

Recreational users who require motorized access would most enjoy short-term benefits under Alternative A. Fewer places would disallow motorized access, potentially decreasing the recreation experience and/or social well-being of individuals or groups who value solitude. Possible degradation of soil, water quality, cultural resources, wildlife, and scenic quality, in areas associated with high OHV use and cross-country travel, could adversely impact the recreation opportunities and visitation in the long-term.

Special Recreation Permits are required for commercial outfitters along the Colorado Riverway SRMA and the Two Rivers SRMA. Both of these SRMAs permit a maximum of 30 outfitters and a total of 24,000 passenger days per year. Outfitters who currently receive permits would likely continue to receive permits, and the revenue generated from river runners within the local economy would continue at current levels.

4.3.12.2.10.4 Alternative B

Under Alternative B there would be 11 SRMAs totaling 1,016,554 acres and 22 focus areas. Generally, this alternative emphasizes non-motorized use while still providing opportunities for motorized vehicle use. Groups or individuals who value solitude and non-motorized activities would have the most places to enjoy under Alternative B, perhaps enhancing the visitor experience. This alternative is least responsive to the desires of individuals and groups who feel public lands should remain open to motorized vehicle access, potentially detracting from their social well-being. The potential for OHV-related damage to resources would be smallest under this alternative, thus having a long-term beneficial impact on visitation to the area.

Because this alternative focuses on non-motorized activities, it is possible that the focus areas would see an increase in hikers and a decrease in OHV users. The emphasis on non-motorized use could lead to greater visitor satisfaction among non-motorized users and a decrease in satisfaction among motorized users. It is possible that dissatisfaction among OHV users could lead to decreases in their economic contributions to Grand County. Given the continuing increase of OHV use within the MPA, a decrease in use by motorized users could be of greater significance than a decrease in use by non-motorized users. Although it is not certain how much money each user group contributes on a daily basis in the Moab area, it is possible that local government revenue from hotel, restaurant, and sales tax on goods purchased would be reduced under Alternative B, should OHV use decline. The fiscal resources of local government would potentially be indirectly impacted by a decrease in recreational visits to the county. Expenditures for leisure and hospitality services are taxed at the local and state levels and are a benefit to local government. Because the proportion of recreation expenditures compared to expenditures from local residents and/or non-recreation consumers is not possible to quantify, it is generally concluded that a decrease in recreation use in the area would lead to a decrease in tax revenues for local government.

Under Alternative B, zero acres would be designated as open to OHV use, with all OHV routes restricted to limited areas (1,475,074 acres). This alternative eliminates all acres open to cross-country travel, which includes closure of the popular White Wash Sand Dunes. While this may lead to an adverse impact to users who enjoy cross-county travel, the majority of OHV use occurs on existing routes according to the best professional judgment of the MFO (Personal communication with Bill Stevens, MPA, and Laura Burch, SWCA, November 9, 2006). Although the exact number of OHV users who use the areas currently designated as open for cross country travel is not known, decreases in their visits to the area because of the restrictions under Alternative B could have minor adverse economic impacts to the county as discussed in the paragraph above.

The recent trend towards the construction of second homes in the Moab area may be due to the scenic and non-motorized recreational opportunities in the area. Although the MPA has not been studied specifically, a multi-county sponsored study in Colorado suggests strongly that second home buyers are attracted to areas primarily based on access to scenery and recreation (Venturoni et al. 2005). The same study found that 82 per cent of these second home owners indicated hiking and jogging as their favorite recreational activities. To the extent that these results can be extrapolated to the MPA, this suggests that an emphasis on preservation of scenery and an emphasis on non-motorized recreation opportunities could fuel continued growth in the second home industry, with concomitant economic benefits to local communities. With the non-motorized focus of Alternative B, higher wage jobs such as construction and infrastructure development resulting from second home construction could likely increase similar to existing trends. The emphasis on non-motorized recreation would continue to draw those interested in non-motorized recreation opportunities to develop second homes and contribute to the local retail economy.

A potential downside to the above scenario exists. Given a limited supply of housing, growth in second home ownership could drive up housing prices in general, as seems to have been the case recently in Grand County. An increase in housing costs could make it more difficult to attract and retain workers in lower wage industries, of which tourism is typically a segment. If tourism-oriented employers find it more difficult to attract and retain employees, the kinds of services expected by recreational visitors may decline in quantity and/or quality. Such an outcome could pose adverse impacts to the local economy. Second home ownership also could cause changes in the demographic character of the local community, which some current residents may regard as undesirable for its perceived impacts on local culture and customs.

Within the 2 SRMAs that require SRPs for river rafting, Alternative B allocates the fewest permits when compared to the other alternatives. Within the Colorado Riverway SRMA, 19 unallocated permits and 2 allocated permits would be issued. Westwater Canyon, within the Two Rivers SRMA, allows for a daily 48-person launch limit for each sector (private and commercial). When compared to the other action alternatives, Alternative B has a 36% reduction in launch limits as compared to Alternative C and a 63% reduction as compared to Alternative D. These reductions would have minor adverse impacts on socioeconomics as fewer river runners would be allowed to run rivers and contribute to the local economies before and/or after trips, assuming these river permits are at maximum capacity currently. Alternatively, a decrease in supply, even with demand constant, could allow commercial outfitters to increase prices, and therefore their own revenues.

4.3.12.2.10.5 Alternative C

Under Alternative C there would be 10 SRMAs totaling 658,642 acres and 30 focus areas. Alternative C emphasizes a balance of recreational opportunities for motorized and non-motorized uses within the MPA. Groups or individuals who value solitude and non-motorized activities would have the greatest number of focus areas emphasizing a range of recreational opportunities. This alternative also promotes the greatest amount of motorized backcountry touring and the most motorized, sporting-event focus areas (although the acreage for the White

Wash Sand Dunes and Dee Pass is slightly reduced compared to Alternative D). This alternative is most responsive to those who feel that a balance of uses should be allowed within the MPA.

With its implementation of SRMAs and focus areas, Alternative C would have the potential to reduce user conflicts to a greater degree than the other alternatives. The reduction in user conflict and the ability for user groups to recreate in specific areas geared toward their particular activities allow for the broadest range of satisfactory user experiences. By providing satisfactory experiences for the widest spectrum of users, Alternative C would provide more potential for increased visitation and economic contributions to the region than would Alternatives A, B, and D. Alternative C, therefore, potentially provides greater long-term economic contributions to the retail economy and, indirectly, to the local government in the form of sales tax revenue.

This alternative would designate 1,866 acres (White Wash Sand Dunes) as open to OHV use, with 1,481,334 acres designated as limited for OHV use. Allowing cross-country travel in the White Wash Sand Dunes would permit motorized users to recreate in a manner not permitted under Alternative B. In addition, the Gemini Bridges/Poison Spider Mesa motorized backcountry touring area and the Dee Pass motorized trail area would be established as focus area for OHV use. By allowing for cross-country travel and other motorized trail access, Alternative C gives OHV users more opportunities to meet their recreation expectations and needs than does Alternative B. Thus, the economic contributions to the local economy by OHV users would be greater under Alternative C than under Alternative B. Moreover, while user conflicts between motorized and non-motorized vehicle users would continue to occur under Alternative A, they would be less likely to occur under Alternative C, and therefore Alternative C would provide more satisfactory user experiences.

By providing for a range of recreational opportunities for all users, Alternative C could have a beneficial impact on local employment. Satisfactory user experiences would result in more tourists returning to the MPA and a corresponding increase in the need for goods and services. A range of jobs would be necessary to meet the needs of tourists, including lower wage service jobs and higher paying professional jobs. Given the reduction in user conflicts under Alternative C, recreation- and tourism-related employment is likely to steadily increase as it has under current conditions. This increase is expected, in the long-term, to exceed the employment needs generated by Alternative A, because user conflicts and resource degradation would be less likely.

Alternative C would allow for similar amounts of Special Recreation Permits within the Colorado Riverway SRMA when compared to Alternatives B and D (21 commercial permits issued annually under Alternatives B and C and 25 under Alternative D). For Westwater Canyon, commercial and private permits are required. The daily launch limit would be 75 people and commercial group size would be 25 plus 3 additional crew. Because Alternative C allows for 36% more people to be permitted on a daily basis on the SRMA rivers (compared to Alternative B), it improves the potential for an increase in local revenue generation. With a 41% decrease in launch limits, compared to Alternative D, potential revenue generated from river runners could be less under Alternative C.

4.3.12.2.10.6 Alternative D

Alternative D emphasizes motorized uses and would provide 6 SRMAs totaling 277,495 acres and 10 focus areas. The majority of acres that would be designated as focus areas would be open to motorized vehicle use. Under Alternative D, 3,604 acres would be designated as open to OHV use, which includes White Wash Sand Dunes and Airport Hills. Alternative D would designate 1,762,083 acres as limited to designated routes, including the Dee Pass Motorized Trail Focus Area.

Emphasizing motorized recreation could have positive, short-term, social impacts on OHV user groups, because the specific group would have greater opportunities to meet their recreation objectives. However, impacts to all other user groups could be adverse under Alternative D and its emphasis on motorized use. Other user groups who believe that recreation on public lands should include opportunities for solitude would have a more challenging time finding places to meet their recreation objectives. The long-term impacts of emphasized motorized use would be adverse, as crowding, user conflicts, and the degradation of the environment would detract from the overall visitor experience for all user groups.

Dissatisfaction among non-motorized users could lead to decreases in economic contributions to Grand County. The decreases in satisfactory recreational experiences by non-motorized users, such as hikers, mountain bikers, and river rafters, may result in fewer returns to the MPA. Although it is not certain how much money each user group contributes on a daily basis in the Moab area, it is possible that local government revenue from hotel, restaurant, and sales tax would be reduced under Alternative D should OHV use be emphasized. While OHV users would still continue to patronize local businesses, the contributions from the range of other users would decrease, adversely impacting local economies. The fiscal resources of local governments would potentially be indirectly impacted by a decrease in recreational visits to the county, as the local- and state-level leisure and hospitality tax revenues would decrease.

Impacts of Alternative D to local employment would be similar to those of Alternative B. By emphasizing the recreation opportunities for one user group and not others, user conflicts and decreases in satisfactory experiences by the other groups could lead to a decrease in visits to the MPA. Thus, fewer goods and services—and therefore employees—would be needed to meet the demand from recreation-based tourism.

The number of individuals allowed per river trip within the Colorado Riverway SRMA and Two Rivers SRMAs is greatest under Alternative D. Should the demand for permits rise to meet Alternative D's permit maximums, benefits to local communities from recreation-based revenue would be greatest under this alternative.

4.3.12.2.11 Impacts of Riparian Decisions on Social and Economic Conditions

Management decisions common to all alternatives for riparian resources would have negligible impacts to the social and economic conditions of communities in Grand and San Juan Counties. The impacts would be negligible because all floodplains and riparian/wetlands would be managed in accordance with Executive Orders, the Clear Water and Endangered Species Act, and Utah's Standards for Rangeland Health, and because there is opportunity for mineral leasing

across all alternatives outside of riparian areas. These mandates and management actions would not allow great variation in the management of the resource such that it would have a substantial impact on the local economy or social character of communities.

4.3.12.2.12 Impacts of Soils/Watershed on Social and Economic Conditions

Soils and watershed actions common to all alternatives would have negligible impacts on socioeconomics. Approximately 58% of lands available for surface disturbing activities are overlain by sensitive soils with high limitations (See Section 4.3.7.3.7 for details). Any surface disturbance projects (e.g., minerals development) initiated on these sensitive soils would require the implementation of specifically tailored of Best Management Practices (BMPs) and mitigation measures. Although the implementation of BMPs may result in minor increases in cost and time on behalf of the project proponent, the medium and high limitations do not prohibit development and therefore do not represent economic loss to the county. Under all alternatives developers would be able to extract oil and gas from over three quarters of medium- and high-risk soils and, as a result, generate revenues for Federal and local governments as well as provide limited opportunities for local employment.

Development on slopes greater than 30% would require a controlled surface-use stipulation, and an additional timing limitation from November 1 through April 30 (181 days) for slopes such as those in the Book Cliffs RFD Area. These special stipulations may require additional costs and time to relocate well pads and pipelines, requirements that may result in a decrease in revenue for the developer. However, impacts to local economic conditions should be minor given that the lands would still be effectively open to development, assuming the requisite minimization of damage to sensitive soils is accomplished.

4.3.12.2.13 Impacts of Special Designations on Social and Economic Conditions

4.3.12.2.13.1 Areas of Critical Environmental Concern (ACECs)

Protecting the relevant and important values associated with Areas of Critical Environmental Concern (ACECs) limits activities that are considered incompatible with the protection of the specific values and resources of concern. Specifically, surface disturbing activities (mineral development, OHV use, road and facilities construction) would be limited as a result of ACEC designations. With specific regard to mineral resource development, ACEC designation could limit areas to development. ACEC designations could have adverse impacts upon oil and gas development in some locations and, therefore, to subsequent revenue for the local economy. Alternatives A and D do not designate ACECs and would not be limited by the special designation restrictions. Outside of WSAs, ACEC designation under Alternative B results in 16.5% of BLM lands with major restrictions for oil and gas leasing (no surface occupancy or closed). ACEC designation under Alternative C results in 1.7% of BLM lands with a no surface occupancy stipulation for oil and gas leasing (See Section 4.3.7.2 for details on acres of potential ACECs available to mineral development). Under Alternatives B and C, the restrictions to and/or exclusion of lands from oil and gas development would lower the number of locations where potential wells could be drilled. The lower number of locations could indirectly lead to a lower yield and commercial supply of oil and natural gas and, therefore, fewer royalties paid to the

Federal, state, and local governments. An approximate monetary impact would be difficult to estimate, because desired future locations of development in proposed ACEC sites is unknown.

Under the two alternatives where ACEC designations are proposed, OHV use would be allowed in ACECs on designated routes, although the miles of Class D roads would vary slightly among alternatives (see Table 4.126 in Section 4.3.16.2.6.1). Allowing OHV access within ACECs could be beneficial in the long-term for socioeconomics, because opportunities would remain available for recreational access. Revenue generated in local communities by OHV users would be similar to current conditions.

4.3.12.2.13.2 Wilderness Study Areas and Wilderness Areas

The MPA contains 11 existing WSAs totaling 348,815 acres (or approximately 16% of BLM lands). WSA designations would continue to apply across all alternatives and would be managed in a manner that does not impair their suitability for congressional designation (BLM 1991c). An ongoing debate exists in the literature as to the economic benefits (or lack thereof) of wilderness, and these arguments may extend to WSAs. However, management of WSAs is non-discretionary across alternatives, and therefore beyond the scope of this analysis. In addition, the management of the Black Ridge Wilderness Area (5,200 acres) is set by law and beyond the scope of this EIS.

4.3.12.2.13.3 Wild and Scenic River Recommendations

Under Alternative A, none of the eligible Wild and Scenic River (WSR) segments carried forward in this RMP would be evaluated for WSR suitability determination. However, the 6 river segments eligible for WSR designation would continue to be managed in a manner that would not impair the WSR eligibility. Social and economic impacts resulting from this management action would be similar to current conditions. Alternative D would not recommend rivers within the MPA for WSR designation. Therefore, special designation decisions under Alternative D regarding WSRs would have no impact on socioeconomics above and beyond current conditions (Alternative A). See Section 4.3.14.4 for river segments proposed for WSR designation under each alternative.

Suitable WSR segments impose no restrictions on oil and gas leasing or other mineral development. Special restrictions were not necessary to protect WSR values because restrictions imposed to benefit other resource values, such as riparian, visuals, and floodplains, were sufficient. Socioeconomic impacts from the restrictions imposed to protect these other resources (riparian, visuals, floodplain) are discussed under the relevant sections.

The designation of WSRs under Alternatives B and C could potentially lead to an increase in tourism revenue to the BLM and local communities, thus having long-term beneficial impact on the local economies. The designation of rivers and/or river segments could attract more people to the area who enjoy the type of recreation that often accompanies these designations (including high scenic qualities and opportunities for solitude). The increase in tourism based on river recreation could lead to increased revenue to local river-running companies and an increase in tourist dollars spent in nearby communities.

4.3.12.2.14 Impacts of Special Status Species and Other Wildlife and Fisheries Decisions on Social and Economic Conditions

Across all alternatives, the impacts to socioeconomics of management actions regarding special status species (e.g., temporary seasonal or spatial buffers and restrictions for roosting or nesting birds, and habitat enhancement to protect special status species) would be minor. Restriction on mineral development within Special Status Species habitats would adversely impact developers during specific times of the year (see Section 4.3.7.3.9). The timing limitations imposed by special status and other wildlife species could potentially hinder development. However, due to the large number of acres open to oil and gas development across alternatives (over 1 million acres) and the number of wells predicted annually (no more than 30 wells) within the MPA, a negligible to minor adverse economic impact would be anticipated, because drilling would commence during periods without seasonal restrictions and, in areas without restrictions, could go on year-round.

4.3.12.2.15 Impacts of Vegetation Decisions on Social and Economic Conditions

Vegetation management efforts may benefit the local economy if labor, seed, and equipment maintenance come from local communities. Since vegetation treatments are expected to be similar in size across all alternatives, there would be no differences among alternatives in social and economic conditions.

4.3.12.2.16 Impacts of Visual Resource Decisions on Social and Economic Conditions

The demand for a range of recreation opportunities would not be limited as a result of VRM (Visual Resource Management) classifications; therefore, impacts to socioeconomics from recreational visitation would be minor under all alternatives. Opportunities for recreation with high levels of scenic quality (VRM Class I and Class II) would remain throughout Wilderness Study Areas (WSAs), Areas of Critical Environmental Concern (ACECs), Special Recreation Management Areas (SRMAs), and along eligible Wild and Scenic river segments. See Section 4.3.12.2.10 for more details on recreation impacts to socioeconomics.

Under all alternatives, designation of lands as VRM Class III or IV would not impose special restrictions on oil and gas development. However, VRM Class I and II do impose restrictions on oil and gas development. VRM Class I results in the imposition of major restrictions on oil and gas development (no surface occupancy or closed). VRM Class II results in the imposition of a controlled surface use stipulation, requiring specific controls or constraints to protect visual resources. Low levels of surface disturbance are permitted under VRM Class II, at a site-specific project level, as long as the disturbance is not visible over the long term, which often requires extensive mitigation.

It should be noted that all WSAs are designated as VRM Class I for all alternatives. However, the limitations to oil and gas development are a result of the WSA designation and not the VRM I classification. Table 4.77 provides the acreage of VRM classes by alternative.

Table 4.77. VRM Class Acreages by Alternative[3]

VRM Class	Alternative A/ VRM Inventory	Alternative B	Alternative C	Alternative D
I	349,110	453,462	358,911	349,617
II	401,015	373,647	365,566	245,773
III	800,782	784,246	829,158	956,724
IV	271,356	210,532	268,133	269,641
Total	**1,822,263[1]**	**1,821,887**	**1,821,768**	**1,821,755**

Source: BLM GIS form 2003 and 2006.

Alternative D would have the least amount of lands with VRM Class I and II designations (595,390 acres) compared to the other alternatives and therefore the most acres open for oil and gas development and greatest potential for mineral-based revenue. Alternatives A, B, and C have similar acreages with VRM I and II (750,125 acres under A, 796,736 acres, under B, and 714,840 acres under C) which would limit the placement of oil and gas wells. Therefore, the difference in economic impacts among Alternatives A-C would be minor.

A potential decrease in revenue based on tourism and sightseeing-based revenue would be greater under Alternative D, should oil and gas wells be visible from popular tourist destinations. Alternatives A and B provide the greatest amount of viewshed protection with VRM Class I and II designations (750,125 acres under Alternative A and 799,736 acres under Alternative B), and therefore the greatest potential for sightseeing-based revenue. Alternative C designates a similar amount of VRM Class I and II, with oil and gas development restricted on 714,840 acres.

Overall, the socioeconomic impacts from visual resource management on oil and gas exploration would be relatively minor given that the maximum number of wells to be developed within the MPA is 450 (under Alternative A) and given the large amount of VRM Class II, III, and IV lands (over 1 million acres under every alternative) available for oil and gas development. The preservation of viewsheds with high scenic quality would allow for the greatest opportunity for recreation and sightseeing-based revenue, thus having long-term beneficial impacts on the local economy and visitor experience.

4.3.12.2.17 Impacts of Woodland Decisions on Social and Economic Conditions

Woodland management actions common to all alternatives would have negligible impacts on the social and economic conditions of communities in Grand and San Juan counties, because the private and commercial use of woodland products is not a substantial contributor to the local economy. No commercial timber sales have occurred within the MPA due to the lack of timber resources. The number of wood gathering permits is not anticipated to increase over the life of the RMP, and the percentage of acres available for woodland gathering does not vary appreciably across any of the alternatives.

[3] Totals are not exact due to GIS shapefile variances.

Willow and cottonwood harvesting by Native Americans for ceremonial uses in riparian areas would be allowed under all alternatives, with negligible impacts to riparian vegetation, since the level of collection is low.

4.3.12.3 Summary of Impacts

Overall, the local economy would not experience substantial adverse impacts from BLM resource management decisions in the form of lessened revenues. Beneficial impacts, in the form of positive visitor experiences and contributions to the local economy, are possible as a result of management decisions but benefits would not vary significantly among alternatives. Many resource management decisions regarding air quality, fire management, hazard management, paleontology, soils and watersheds, special status species, and woodlands would have negligible impacts on the social and economic conditions of Grand and San Juan Counties. Resource management decisions regarding cultural resources, lands and realty, livestock grazing, minerals, non-WSA lands with wilderness characteristics, recreation, special designations, and visual resource management would have a greater impact. Population, employment, and local revenue would remain relatively unchanged with the implementation of any of the proposed alternatives. The influence of proposed resource management decisions would not contribute to a substantial change to the local economic diversity of Grand or San Juan Counties.

4.3.13 Soils and Water Resources

This section discusses impacts to soils and water resources from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning soils and water resources are described in Chapter 3.

For the purposes of this broad scale analysis, the primary indicator of impacts to soils and water resources is the amount of surface disturbance caused by management decisions made for other resources, particularly surface disturbance that occurs in highly erodible, reclamation-limited, or other sensitive soils. Another important indicator of impacts to water resources is a decrease in water quality conditions in perennial streams, including levels of suspended sediments, sediment bedload, dissolved solids, nutrient loads, bacteria counts, and water temperatures. Once these parameters exceed the State water quality standards at a site, the perennial stream is listed on the 303d list, which is the final indicator of poor water quality conditions.

Surface disturbance would impact soils and water resources to varying degrees, depending on the amount, location, and type of surface disturbance; the soil type; the time of year and the surface hydrology. Surface-disturbing activities that currently occur and that are expected to continue include grazing, oil and gas and mineral exploration and development and associated access routes, recreation and OHV use, and woodland harvest and other forms of vegetation removal and treatments.

All soils in the MPA are susceptible to accelerated erosion, but sensitive soils are more susceptible to impacts. Surface-disturbing activities could result in any of the following impacts under any alternative: increased soil erosion and sedimentation, decreased soil productivity, changes to quantity and quality (e.g., salinity) of surface water and groundwater, loss of

vegetation or prevention of revegetation, or introduction of noxious weeds and the attendant increases in water use (e.g., tamarisk uses large quantities of groundwater) and/or changes in soil chemistry and productivity. Analyses of impacts to soil and water resources in this section are based upon the factors contributing to site degradation and their inherent risks (Table 4.78), according to SSURGO soils mapping for the MPA.

Some sites are at risk of degradation because surface layer wind and/or water erodibility factors are high. Kw refers to the relative ease of water erosion. The slope factor accounts for the tendency of steeper slopes to erode more easily. The wind erodibility group refers to the relative ease of wind transport of surface materials.

Other sites are at risk of degradation due to reclamation-limiting factors (i.e., factors that prevent soils from being fully reclaimed following surface disturbance). See Table 4.78 for a list of these factors. In reclamation-limited soils, one or more factors make site reclamation difficult in semi-arid environments, including alkalinity, droughty soils, soil rooting depth, salinity, available water capacity, and sodium adsorption. Available water capacity refers to the amount of water available for plant uptake. Salinity refers to the amount of salt within soils that can be dissolved in surface waters. The sodium adsorption ratio refers to the amount of sodium that can be held by the soils and influence nutrient uptake. Rooting depth refers to the depth of soil, which influences how far plant roots can grow. Finally, alkalinity refers to soil pH, which generally limits plants' ability to establish when it is higher (i.e., more basic).

Table 4.78. Factors Contributing to Site Degradation and Their Inherent Risks*

Factors	High Risk	Moderate Risk	Low Risk	Restrictive Feature
Erodibility				
Kw Factor (surface layer) and Slope (sl)[1]	K ≥ .37, sl ≥ 10%; or K = .20-.36, sl > 30%	K = .20-.36, sl 10-30%; or K < .20, sl > 30%	K < .20, sl 10-30%; or sl < 10%	Water erosion hazard
Wind Erodibility Group (surface layer)	1, 2	3, 4, 4L	5–8	Wind erosion hazard
Limits on Reclamation				
Available Water Capacity (average to 40 inches; in/in)[2]	< 0.05	0.05–0.10	0.10 <	Droughty soils
Salinity3 (mmhos/cm; surface layer)	16 <	8–16	< 8	Excess salt
Sodium Adsorption Ratio4 (surface layer)	13 <	4–13	< 4	Excess sodium
Depth to Bedrock or Hardpan (inches)	< 10	10–20	20 <	Rooting depth
Alkalinity (pH of surface layer)	9.0 ≤	7.8–8.9	< 7.8	Excess alkalinity

* Draft parameters developed by the BLM's National Science and Technology Center, SSURGO soils mapping.

[1] K Factor of surface layer adjusted for the effect of rock fragments. Slope is the maximum value for the range of slope of a soil component within a map unit.

[2] Maximum value for the range of available water capacity for the soil layer; inches of water per inches of soil.

[3] Maximum value for the range in soil salinity.

[4] Maximum value for the range in sodium adsorption ratio.

An important soil component often affected by surface disturbance is the biological soil crust, comprised of cyanobacteria, lichens and mosses. These crusts help to stabilize soils, reducing erosion and increasing soil productivity. Biological soil crusts have not been mapped and could occur in most of the soils within the MPA.

Throughout this analysis, highly erodible soils, reclamation-limited soils, and biological soil crusts are collectively referred to as sensitive soils. Biological soil crusts are discussed only qualitatively and are not included in the tables. However, any of the other soil parameters may overlap in any area, and so acreages presented in this analysis are not additive. For example, a particular acreage may have soils with shallow rooting depth as well as high wind erodibility. Acreages are also only approximate, due to limitations in soil mapping techniques and the planning area-wide scale of analysis.

Decisions regarding the management of resources other than soil and water in the MPA may affect soil and water resources either directly or indirectly. Those impacts may be beneficial or adverse, and are described below. Management decisions regarding air quality, paleontology, socioeconomics, special status species, vegetation, visual resources, wildlife resources, or woodland resources would result in negligible impacts to soils and water resources. The impacts would be negligible because protecting air quality, allowing recreational fossil collection and scientific study of fossils, improving the local and regional economy, protecting federally listed species and their habitat under the Endangered Species Act, improving and maintaining native vegetation communities, protecting scenic quality, permitting woodland harvesting, and maintaining habitat for non-listed wildlife species would not have surface-disturbance impacts on sensitive soils and soil crusts. Therefore, impacts from these management decisions were not analyzed. Travel management decisions are included in the discussion of recreation decisions.

4.3.13.1 Impacts of Fire Management Decisions on Soils and Water Resources

Under all alternatives, fire management would follow the guidelines in the Utah Land Use Plan Amendment for Fire and Fuels Management (LUP; BLM 2005c). Under all alternatives, estimated fuels reduction treatments of 5,000–10,000 acres per year would be targeted. Because specific areas are not designated for treatment each year, the specific soils affected are unknown; therefore, a qualitative assessment of short- and long-term impacts follows. Individual fire management projects will be analyzed at the implementation level with site-specific NEPA documentation under all alternatives.

The impacts of fire management on soil and water resources would be adverse in the short term due to increased erosion and sedimentation and runoff from areas where vegetation is removed during prescribed burns or other fuels-reduction treatments. Fuels-reduction treatments would be designed to limit these impacts in areas with sensitive soils and to surface hydrology via implementation of emergency stabilization techniques described in the LUP, which would reclaim plant cover and reduce erosion and subsequent sedimentation of surface waters.

Long-term, beneficial impacts to soils and water resources would occur under all alternatives due to a reduction of the risk of catastrophic fires and the establishment of a more natural fire return interval. Impacts would take the form of reduced frequency and number of high-intensity fires

fewer hydrophobic soils, increased infiltration, decreased flood magnitude, and less erosion and sedimentation. These fire management decisions would also lower the potential for long-term loss of vegetative cover and the attendant stream sedimentation and changes in surface hydrology that can occur with increased runoff timing and intensity. A detailed analysis of these treatments' impacts to soils and water resources is included in the LUP's EA (BLM 2005c).

4.3.13.2 Impacts of Health and Safety Decisions on Soils and Water Resources

Under all alternatives, where Abandoned Mine Lands (AMLs) are rehabilitated, the management of hazardous materials would result in beneficial impacts to soils and water resources in the short and long term by reducing water quality-related threats to public health and/or the environment. The impacts would be identical under all alternatives.

4.3.13.3 Impacts of Lands and Realty Decisions on Soils and Water Resources

Under all alternatives, surface disturbance within utility corridors would potentially impact sensitive soils. Impacts to total acres disturbed and acres of sensitive soils disturbed were analyzed by alternative. Because no particular data on the distribution of biological soil crusts are available, only a qualitative discussion is included. The widths of proposed utility corridors vary by alternative, and are analyzed by approximate total acreage of disturbed soils and disturbed sensitive soils contained within the corridors. Table 4.79 presents these acreages within proposed utility corridors under each alternative.

4.3.13.3.1 Alternative A

Under Alternative A, utility corridors have the potential to impact up to 32,502 acres of soils and up to 25,700 acres of sensitive soils; see Table 4.79). Based on a comparison of these maximum acreages of total soils and sensitive soils across all alternatives, Alternative A represents the least adverse impact to total soils and sensitive soils due to surface disturbance associated with utility corridors.

4.3.13.3.2 Alternative B

Under Alternative B, utility corridors have the potential to adversely impact up to 65,865 acres of total soils and up to 56,500 acres of sensitive soils (see Table 4.79). Impacts would take the forms described under Alternative A. This potential for adverse impacts is greater than Alternative A because there are more acres of designated corridors, but much less than Alternatives C and D because there are fewer acres in this alternative.

4.3.13.3.3 Alternative C

Under Alternative C, utility corridors have the potential to adversely impact up to 173,099 acres of total soils and up to 135,500 acres of sensitive soils (see Table 4.79). Impacts would take the forms described under Alternative A. This potential for adverse impacts is much greater than Alternatives A and B, and slightly less than Alternative D due to the total number of acres proposed within utility corridors.

Table 4.79 Sensitive Soils in Designated Utility Corridors

Sensitive Soil	Alternative A		Alternative B		Alternative C		Alternative D	
	Acres	% of MPA	Acres	% of MPA	Acres O	% of MPA	Acres	% of MPA
Wind-erodible	650	<0.1	1,200	<0.1	3,700	0.1	3,700	0.2
Water-erodible	80	0.0	20	0.0	220	<0.1	220	<0.1
Alkalinity	8900	.05	18,500	1.0	33,000	1.8	38,700	2.1
Droughty	13,000	0.7	24,700		58,700	3.2	68,500	3.7
Rooting Depth	25,700	1.4	56,500	1.4	135,500	7.4	164,200	9.0
Salinity	9,800	0.5	19,500	3.1	37,400	2.0	45,750	2.5
Sodium Adsorption	9,800	0.5	19,500	1.0	37,700	2.0	46,500	2.5
Total Acreage**	**32,502**		**65,865**	**1.0**	**173,099**		**204,168**	

* Comprises Standard Conditions and Controlled Surface Use/Timing Limitations leasing categories.

** Acreages of soil types are not additive, as some soils may exhibit more than one sensitive soil characteristic. Total acreage refers to ALL soils types, not just sensitive soils.

4.3.13.3.4 ALTERNATIVE D

Under Alternative D, utility corridors have the potential to adversely impact up to 204,158 acres of total soils and 164,200 acres of sensitive soils (see Table 4.79). Impacts would take the forms described under Alternative A. This potential for adverse impacts is the greatest under Alternative D since the most acres would be proposed in utility corridors in this alternative.

4.3.13.4 IMPACTS OF LIVESTOCK GRAZING MANAGEMENT DECISIONS ON SOILS AND WATER RESOURCES

Under all alternatives, the impacts of livestock grazing management decisions on soils and water resources would depend upon the number of acres of total and sensitive soils, acres of riparian zone, and the miles of perennial streams in each allotment that are available for grazing Depending on season and duration of use, grazing would have direct, adverse impacts on soil productivity and indirect, adverse impacts to water quality due to trampling of soils and loss of biological soil crusts and vegetative cover, especially in riparian areas. Changes in timing may affect the degree of these adverse impacts. For example, limiting grazing during the growing season allows streambanks to retain their vegetation, which protects them from erosion caused by high flows and results in fewer adverse impacts. In addition, if the grazing season on saline soils ends by March 2, the freeze-thaw cycle can partially restore soil infiltration rates and reduce compaction.

Development of Allotment Management Plans (AMPs) and use of grazing systems, as well as the monitoring of grazing for compliance with all rangeland standards, would be beneficial to soils and water resources. To the extent possible, AMPs and grazing systems would reduce damage to soils, and where monitoring showed site degradation, adaptive management of livestock use via changes in seasons of use and exclusion of grazing from areas that do not meet rangeland standards would mitigate impacts to soils and water resources.

The acres of sensitive soils affected by each alternative are shown in Table 4.80. The alternatives vary season of use on certain sensitive soils, with varying impacts to these soils. Therefore, the discussion of impacts is qualitative and not quantitative.

Livestock grazing would be excluded from riparian areas in the following allotments: Between the Creeks, North Sand Flats, South Sand Flats, and Castle Valley. This would provide relatively beneficial impact to 47,247 acres of soils, 10,026 acres of sensitive soils and 1,122 acres of riparian habitat.

The earlier in the year the grazing season ends, the fewer impacts to soils and water resources. Spring rest is important to soils, as the freeze-thaw cycle improves soil permeability and infiltration rates and therefore overall soil productivity. With productive soils, erosion is minimized and impacts to water quality are reduced. With later grazing seasons, soils are compacted and the freeze-thaw cycle improvements are negated. Also, late spring grazing tends to utilize riparian areas more, and may reduce proper functioning conditions and impact water quality conditions.

Table 4.80. Grazing Impacts on Erodible and Reclamation-limited Soils, by Alternative

Alternative	Status	Erodible		Reclamation-limited				
		Wind-erodible	Water-erodible	High Alkalinity	Droughty Soils	Rooting Depth	High Salinity	Sodium Adsorption
A	Acres Open	39,050	13,150	106,200	619,200	838,100	119,900	139,750
	Acres Closed	700	2,800	550	71,450	22,950	250	250
	% Open	98.2	82.4	99.5	89.7	97.3	99.8	99.8
B	Acres Open	37,850	13,100	106,200	602,300	823,250	119,900	139,750
	Acres Closed	1,900	2,850	550	88,400	37,800	250	250
	% Open	95.2	82.1	99.5	87.2	95.6	99.8	99.8
C	Acres Open	38,750	13,450	106,200	624,100	836,650	119,900	139,750
	Acres Closed	1000	2,550	550	66,550	24,400	250	250
	% Open	97.5	84.1	99.5	90.4	97.2	99.8	99.8
D	Acres Open	38,950	15,750	106,200	651,050	846,500	119,900	139,750
	Acres Closed	850	250	550	39,600	14,550	250	250
	% Open	97.9	98.4	99.5	94.3	98.3	99.8	99.8

Other grazing decisions that would vary among alternatives are the proposed adjustment of grazing practices, and the development of AMPs. These decisions, when implemented, would generally reduce surface disturbance. Manipulation would limit the intensity and duration of grazing impacts, but not entirely avoid them. AMPs would result in benefits because they may utilize both grazing manipulation and some timing restrictions. Timing restrictions would protect soils from compaction during wet periods and from subsequent increases in surface runoff and erosion, and would generally be the most protective of soils and water resources.

4.3.13.4.1 ALTERNATIVE A

Management of grazing in saline soils would reduce impacts from saline soil erosion through grazing manipulations. This would reduce surface and vegetation disturbance on moderate to highly saline soils in the MPA, providing some protection for sensitive soils. These management actions would provide the lowest level of protection for sensitive soils of any of the alternatives.

About 126,907 acres would not be available for grazing. This is a beneficial impact to 126,907 acres of soils, 84,949 acres of sensitive soils, and 4,418 acres of riparian habitat. Impacts are also reduced in the Mill Creek and Castle Valley municipal watersheds and the Cottonwood-Diamond watershed (because of the exclusion of grazing in the Castle Valley, Cottonwood and Diamond allotments). This would reduce impacts to water resources and floodplains and would improve overall watershed. Removal of grazing in the Diamond, Cottonwood and Nash watersheds (within the Diamond, Cottonwood and Bogart allotments) would lead to increased stability of stream channels and improved riparian health. Erosion and sedimentation would decrease with the removal of grazing from these very steep allotments.

The 2003 catastrophic wildfire which severely burned the Diamond and Cottonwood allotments released erosion of loose alluvial sediments at an accelerated rate. The stream channels are very unstable, with excessive bank erosion. Beneficial impacts in these watersheds would be realized with the continued cessation of grazing. These impacts would include increased time for post-fire ecological recovery, decreased sedimentation and erosion, increased water quality conditions (water temperature, sediment loads and turbidity), increased aquatic habitat conditions and increased riparian health and post-fire recovery.

While short term adverse impacts consisting of vegetation removal and soil erosion could occur, range projects, including vegetation treatments, implemented to benefit livestock and other resource values would result in long term benefits to soils and water resources.

4.3.13.4.2 ALTERNATIVE B

Under Alternative B, management of grazing in saline soils would reduce impacts from saline soil erosion by using Standards for Rangeland Health and Guidelines for Grazing Management to consider adjustments in seasons of use on allotments with saline soils to minimize soil compaction. Grazing management decisions would protect sensitive soils most under Alternative B; they would result in:

- reduced soil compaction and erosion of saline soils, due to timing restrictions during critical months of the year; and
- improved soil productivity and water quality over the long term

About 153,797 acres would not be available for grazing. This is a beneficial impact to 153,797 acres of soils, 106,752 acres of sensitive soils and 4,953 acres of riparian habitat. Impacts are also reduced in the Mill Creek and Castle Valley municipal watersheds and the Cottonwood-Diamond watershed (because of the exclusion of grazing in the Castle Valley, Cottonwood and Diamond allotments). This would reduce impacts to water resources and floodplains and would improve overall watershed health. Removal of grazing in the Diamond, Cottonwood and Nash watersheds (within the Diamond, Cottonwood and Bogart allotments) would lead to increased stability of stream channels and improved riparian health. Erosion and sedimentation would decrease with the removal of grazing from these very steep allotments.

The 2003 catastrophic wildfire which severely burned the Diamond and Cottonwood allotments released erosion of loose alluvial sediments at an accelerated rate. The stream channels are very unstable, with excessive bank erosion. Beneficial impacts in these watersheds would be realized with the continued cessation of grazing. These impacts would include increased time for post-fire ecological recovery, decreased sedimentation and erosion, increased water quality conditions (water temperature, sediment loads and turbidity), increased aquatic habitat conditions and increased riparian health and post-fire recovery.

Grazing in 4,422 acres of riparian resources and along 58 miles of perennial stream would be excluded. This would provide beneficial impacts to water resources and floodplain stability, and improve overall watershed health.

While short term adverse impacts consisting of vegetation removal and soil erosion could occur, range projects, including vegetation treatments, implemented to benefit resource values would result in long term benefits to soils and water resources. No other alternative would implement range projects solely to reduce soil compaction and erosion; therefore, of all the alternatives, Alternative B represents the greatest, short- and long-term, beneficial impacts to soils and water resources.

4.3.13.4.3 ALTERNATIVE C

Under Alternative C, management of grazing in saline soils would reduce impacts from saline soil erosion via AMPs. These protection measures would result in increased forage and improved soil productivity and water quality over the long term, due to implementation of vegetation treatments to benefit wildlife or watershed values. While short term adverse impacts consisting of vegetation removal and soil erosion could occur, range projects, including vegetation treatments, implemented to benefit livestock and other resource values would result in similar long term benefits to soils and water resources.

About 114,234 acres would not be available for grazing. This is a beneficial impact to 114,234 acres of soils, 80,178 acres of sensitive soils and 4,279 acres of riparian habitat. Impacts are also reduced in the Mill Creek and Castle Valley municipal watersheds and the Cottonwood-Diamond watershed (because of the exclusion of grazing in the Castle Valley, Cottonwood and Diamond allotments). This would reduce impacts to water resources and floodplains and would improve overall watershed health. Removal of grazing in the Diamond, Cottonwood and Nash watersheds (within the Diamond, Cottonwood and Bogart allotments) would lead to increased stability of stream channels and improved riparian health. Erosion and sedimentation would decrease with the removal of grazing from these very steep allotments.

The 2003 catastrophic wildfire which severely burned the Diamond and Cottonwood allotments released erosion of loose alluvial sediments at an accelerated rate. The stream channels are very unstable, with excessive bank erosion. Beneficial impacts in these watersheds would be realized with the continued cessation of grazing. These impacts would include increased time for post-fire ecological recovery, decreased sedimentation and erosion, increased water quality conditions (water temperature, sediment loads and turbidity), increased aquatic habitat conditions and increased riparian health and post-fire recovery.

Alternative C would restrict grazing in 1,169 acres of riparian resources. This would provide beneficial impacts to water resources and floodplain stability, and improve overall watershed health along 28 miles of perennial stream.

Overall, Alternative C would provide more protection for saline soils than Alternatives A and D, but less protection than Alternative B.

4.3.13.4.4 ALTERNATIVE D

About 52,217 acres would be unavailable for grazing. This is a beneficial impact to 52,217 acres of soils, 43,999 acres of sensitive soils and 1,177 acres of riparian habitat. Impacts from grazing

are reduced in the Mill Creek and Castle Valley municipal watersheds (because of the exclusion of grazing in the Mill Creek and Castle Valley allotments). This would reduce impacts to water resources and floodplains and would improve overall watershed.

Under this alternative, the Cottonwood and Diamond watersheds (within the Cottonwood and Diamond allotments) would be available for grazing, with adverse impacts to these watersheds. These watersheds, which suffered a catastrophic fire in 2003, could be subject to increased erosion of loose alluvial sediments and sedimentation. Stream channel stability would decrease, bank erosion would be excessive, and riparian health would deteriorate if grazing were to be reintroduced into these allotments. Adverse impacts in these watersheds would result with the reintroduction of grazing. These impacts would include decreased time for post-fire ecological recovery, increased sedimentation and erosion, decreased water quality conditions (water temperature, sediment loads and turbidity), decreased aquatic habitat conditions and decreased riparian health and post-fire recovery.

4.3.13.5 Impacts of Mineral Resource Decisions on Soils and Water Resources

The impacts of mineral resource decisions on soils and water resources were assessed by the acres of potential surface disturbance to total soils/sensitive soils under each alternative. Throughout this analysis, it was assumed that areas open to minerals development would be more likely be subjected to surface-disturbing activities, although the actual amount of future mineral development cannot be predicted.

As mentioned in Section 4.3.13, above, biological soil crusts, which have potential to be impacted by surface-disturbing activities, have potential to occur on any soils in the MPA. No quantitative data are available for these soils. Therefore, the quantitative analysis in this section applies only to reclamation-limited soils and highly erodible soils.

Under all alternatives, disturbance of total soils/sensitive soils associated with mineral resource development would contribute to adverse impacts to soils and water resources in general, including loss of vegetative cover and soil productivity and sedimentation of surface waters. In particular, noxious weed infestation resulting from disturbance of reclamation-limited soils would impact soil productivity and would cause changes in surface water hydrology. Biological soil crusts would potentially be crushed during surface disturbance and would no longer be protected from wind and/or water erosion. Damaged biological soil crusts would also take longer to be reclaimed after the completion of development, due to the long period of time needed to develop these crusts (BLM 2001d).

Under all alternatives, the acreage of total soils/sensitive soils in each BLM leasing category (i.e., Standard Conditions, Controlled Surface Use and/or Timing Limitations, No Surface Occupancy, and Closed, listed from greatest to least amount of surface disturbance) would quantify impacts to sensitive soils in terms of acres of surface disturbance. Generally, areas that are Closed to development or subject to No Surface Occupancy would experience little or no surface disturbance due to minerals development; thus, negligible or no adverse impacts to soils and water resources would occur. Areas of sensitive soils subject to Standard Conditions or conditions of Controlled Surface Use and/or Timing Limitations would experience short- and

long-term impacts to soils and water resources from surface disturbance associated with minerals development. These short- and long-term adverse impacts would include destruction of biological soil crusts; erosion and subsequent sedimentation of surface waters; changes in surface hydrology and infiltration; and possible alteration of soil chemistry and/or productivity by noxious weeds.

Across all alternatives, over the life of the RMP, projected surface disturbance in the Big Flat – Hatch Point, Eastern Paradox, Lisbon Valley, Roan Cliffs, and Salt Wash RFD areas would be minimal and negligible because the level of development is expected to be low. However, the Bookcliffs and Greater Cisco RFD Areas have far greater acreages of sensitive soils with potential to be impacted by surface disturbance associated with minerals development (BLM 2005e; see Table 4.1). Analysis of the alternatives therefore focuses on the Bookcliffs and Greater Cisco RFD areas (Tables 4.81 and 4.82). Surface disturbance due to geophysical exploration also has the potential to impact soils and water resources under each alternative.

Approximate acreages of exploration-associated surface disturbance over the life of the plan were determined (though exact locations of exploration and disturbance cannot be determined), and a quantitative analysis of impacts to sensitive soils due to geophysical exploration is also provided under each alternative.

Finally, approximately 1,015 acres of surface disturbance are expected to occur due to the development and extraction of locatable, salable, and leasable (other than oil and gas) minerals under all alternatives (BLM 2005f). Although the locations of these surface disturbances relative to sensitive soils in the MPA are unknown, they would have a adverse impact on soils and water resources through soil disturbance, soil compaction, and mixing of soil horizons. They could potentially increase runoff and erosion as well, and lead to the invasion of noxious weeds.

4.3.13.5.1 ALTERNATIVE A

Under Alternative A, at least 41% of soils in the MPA with at least one limiting factor have the potential to be disturbed by mineral resource development (see Table 4.81). Adverse impacts resulting from this disturbance would take the form of degradation of soil productivity, erosion, and sedimentation of surface waters. Under Alternative A, mineral leasing decisions would result in the highest total surface disturbance of all the alternatives. Therefore, Alternative A represents the greatest potential for adverse impacts to sensitive soils, because erodible, reclamation-limited, and biological crusted soils are most likely to be open to mineral development under this alternative (see Table 4.81).

Within the Book Cliffs and Greater Cisco RFD areas (approximately 14.5% of the MPA; see Table 4.82), more surface disturbance is expected than under Alternative B. A total of 300 wells would be installed in these RFD areas over the life of the plan, resulting in surface disturbance on 4,504 acres and impacting soils and water resources in the short and long term. Surface occupancy for oil and gas leasing would be allowed on a similar acreage of reclamation-limited soils to Alternatives C and D.

Table 4.81. Sensitive Soils with Potential to be Impacted by Oil and Gas Leasing, All RFD Areas

Alternative	Status	Wind-erodible	Water-erodible	Alkalinity	Droughty	Rooting Depth	Salinity	Sodium Adsorption
Alternative A	Acres Open[1]	36,800	9,700	106,600	519,800	743,250	120,000	129,950
	Acres Closed[2]	2,950	6,200	50	169,900	116,700	50	10,000
	% of MPA Open	2.0	0.5	6.0	29.0	41.0	7.0	7.0
Alternative B	Acres Open[1]	23,300	4,450	106,200	282,650	470,300	104,600	106,650
	Acres Closed[2]	16,400	11,500	500	407,700	390,700	15,500	33,400
	% of MPA Open	1.3	0.2	6.0	16.0	26.0	6.0	6.0
Alternative C	Acres Open[1]	32,000	6,700	106,200	397,100	691,450	120,100	130,500
	Acres Closed[2]	7,800	9,200	500	293,200	169,500	0	9,500
	% of MPA Open	2.0	0.4	6.0	22.0	38.0	7.0	7.0
Alternative D	Acres Open[1]	34,800	9,300	106,200	492,750	732,500	120,100	130,500
	Acres Closed[2]	4,900	6,700	500	197,900	128,550	0	9,500
	% of MPA Open	2.0	0.5	6.0	27.0	40.0	7.0	7.0

[1] Comprises Standard Conditions and Controlled Surface Use/Timing Limitations leasing categories.
[2] Comprises No Surface Occupancy and Closed leasing categories.

Table 4.82. Oil and Gas Leasing Impacts on Erodible and Reclamation-limited Soils in the Bookcliffs and Greater Cisco RFD Areas

Alternative	Status	Bookcliffs RFD Area Only			Greater Cisco RFD Area Only		
		Wind-erodible	Water-erodible	Reclamation-limited	Wind-erodible	Water-erodible	Reclamation-limited
Alternative A	Acres Open[1]	0	3,300	74,000	2,200	430	189,400
	Acres Closed[2]	0	2,950	22,200	200	200	7,500
	% of MPA Open	0.0	<1.0	4.1	<1.0	<1.0	10.4
Alternative B	Acres Open[1]	0	2,600	53,600	1,900	10	82,600
	Acres Closed[2]	0	3,700	42,900	500	630	114,400
	% of MPA Open	0.0	<1.0	3.0	<1.0	<1.0	4.5
Alternative C	Acres Open[1]	0	3,200	21,600	200	400	190,350
	Acres Closed[2]	0	3,050	74,900	2,200	200	6,700
	% of MPA Open	0.0	<1.0	4.1	<1.0	<1.0	10.5
Alternative D	Acres Open[1]	0	3,300	75,300	2,200	200	190,400
	Acres Closed[2]	0	2,900	21,200	200	400	6,400
	% of MPA Open	0.0	<1.0	4.1	<1.0	<1.0	10.5

[1] Comprises Standard Conditions and Controlled Surface Use/Timing Limitations leasing categories.
[2] Comprises No Surface Occupancy and Closed leasing categories.

Under Alternative A, geophysical exploration has the potential to disturb 2,397 acres within the MPA, any portion of which may be sensitive soils. Impacts, if they occur, would take the forms described above.

Overall, because it represents the highest acreage of sensitive soils Open to mineral resource development (and surface disturbance) of all the alternatives, Alternative A is most likely to adversely impact sensitive soils on a planning area-wide level. Assuming all alternatives adversely impact sensitive soils, Alternative A would impact the same number of acres as Alternatives C and D also resulting in the greatest acreage of adverse impacts to sensitive soils.

4.3.13.5.2 ALTERNATIVE B

Under Alternative B, at least 26% of soils in the MPA with at least one limiting factor have the potential to be disturbed by mineral resource development (see Table 4.81). Adverse impacts resulting from this disturbance would take the forms described under Alternative A. Alternative B is 15% less than Alternative A and represents the least potential for adverse impacts to sensitive soils, because erodible, reclamation-limited, and biological crusted soils are least likely to be open to mineral development under this alternative (see Table 4.81).

Under Alternative B, surface occupancy for oil and gas leasing would be allowed on reclamation-limited soils within the Book Cliffs and Greater Cisco RFD areas on approximately 7.5% of the MPA, which is approximately 50% fewer acres of reclamation-limited soils open to surface disturbance than under Alternative A. A total of 149 wells would be installed in these two RFD areas over the life of the plan resulting in surface-disturbance on 2,235 acres, which would result in approximately 50% less surface disturbance than Alternative A.

Under Alternative B, geophysical exploration has the potential to disturb 1,404 acres within the MPA, any portion of which may be sensitive soils. Impacts would take the forms described under Alternative A. Geophysical exploration under Alternative B is much less likely to adversely impact sensitive soils than it is under Alternative A.

Based on the acreages detailed in Tables 4.81 and 4.82, of all the alternatives, Alternative B would have the least adverse impacts to soil and water resources due to mineral resource development decisions.

4.3.13.5.3 ALTERNATIVE C

Under Alternative C, at least 38% of soils in the MPA with at least one limiting factor have the potential to be disturbed by mineral resource development (see Table 4.81). Adverse impacts resulting from this disturbance would take the forms described under Alternative A. Alternative C, only 3% less than Alternative A, closely resembles that alternative as well as Alternative D, in the magnitude of impacts to sensitive soils from oil and gas leasing decisions (see Table 4.82).

In addition, slightly fewer acres of reclamation-limited soils within the Book Cliffs and Greater Cisco RFD areas would be open to surface occupancy (approximately 14.5% of the MPA). The

impacts from these activities would be extremely similar to other alternatives other than differences in the areas over which they would occur.

Under Alternative C, geophysical exploration has the potential to disturb 2,072 acres within the MPA, any portion of which may be sensitive soils. Impacts would take the forms described under Alternative A. Geophysical exploration under Alternative C is somewhat less likely to adversely impact sensitive soils than Alternative A, but more likely than Alternative B.

4.3.13.5.4 Alternative D

Under Alternative D, at least 40% of soils in the MPA with at least one limiting factor have the potential to be disturbed by mineral resource development (see Table 4.81). Adverse impacts resulting from this disturbance would take the forms described under Alternative A. Alternative D, being only 1% less than Alternative A, most closely resembles Alternative A in the magnitude of impacts to sensitive soils from oil and gas leasing decisions (see Table 4.81), but also closely resembles Alternative C.

This is true for the amount of reclamation-limited soils within the Book Cliffs and Greater Cisco RFD areas open to surface occupancy (approximately 14.5% of the MPA) as well

Under Alternative D, geophysical exploration has the potential to impact 2,329 acres, any portion of which may be sensitive soils. This would result in the same amount of surface disturbance as under Alternative A and would take the forms described under Alternative A.

4.3.13.6 Impacts of Non-WSA lands with Wilderness Characteristics Resource Decisions on Soils and Water Resources

Management of lands that have wilderness characteristics varies by alternative. Generally, limits on surface disturbance and motorized recreation on lands with wilderness characteristics would protect soils and water resources from adverse impacts.

4.3.13.6.1 Alternative A and Alternative D

There are no management decisions regarding non-WSA lands with wilderness characteristics under Alternatives A and D. Therefore, no additional protection for soils and water resources would occur under these alternatives.

4.3.13.6.2 Alternative B

Under Alternative B, management decisions regarding non-WSA lands with wilderness characteristics would occur on 266,485 acres. One such decision would prohibit surface-disturbing activities on the entire 266,485 acres, any portion of which may be sensitive soils. Of all the action alternatives, Alternative B would manage the most acres to maintain wilderness characteristics. Management under Alternative B would therefore provide the most protection for sensitive soils against adverse impacts due to surface disturbance and motorized recreation.

4.3.13.6.3 ALTERNATIVE C

Under Alternative C, management decisions regarding non-WSA lands with wilderness characteristics would occur on 47,761 acres. One such decision would prohibit surface-disturbing activities on the entire 47,761 acres. This restrictions applies on fewer acres than Alternative B, but more than Alternatives A and D. Management under Alternative C would therefore potentially result in fewer impacts to soils and water resources than would Alternatives A and D.

4.3.13.7 IMPACTS OF RECREATION AND TRAVEL MANAGEMENT DECISIONS ON SOILS AND WATER RESOURCES

Under all alternatives, recreation and travel management decisions—primarily regarding OHV use—would affect soils, biological soil crusts, and water quality. Surface disturbance from OHV use would increase soil erosion, decrease soil productivity and infiltration rates, and may decrease water quality. Disturbance levels would be related to the amount of surface disturbance, soil type and slope, and proximity to water resources. Limiting OHV use to designated routes and closing some areas would minimize or eliminate adverse impacts to soils and water.

Where proposed under the alternatives, control of human waste through installation of vault toilets in high-use recreation areas generally would benefit water quality by reducing E. coli contamination and nutrient-loading of surface waters. Designation of camping areas generally would limit the surface disturbance that results from dispersed camping and unofficial fire pits and, thus, would limit adverse impacts to soils.

Under all alternatives, the proper management of designated trails (e.g., installing signage, enforcing closures, proper trail design on slopes, etc.) would limit impact to soils and water resources. However, the alternatives differ in the total acres of soils and the number of acres of sensitive soils as well as miles of perennial streams and acres of riparian resources that are open or closed to OHVs or in which OHVs are limited to designated routes. Because closures and limiting OHVs to designated routes both generally result in no additional surface disturbance that impacts soil and water resources, these two OHV use categories were analyzed together for each alternative (Table 4.83).

Under all alternatives, SRMAs would be established to manage recreational use and to mitigate impacts caused by this use, such as uncontrolled camping, parking, and other activities. The greater the proportion of public lands managed as SRMAs, the greater the ability to control the impacts resulting from recreation use, resulting in fewer impacts to soils and watershed. See Table 4.84 for acreage of SRMAs by alternative. In addition, river recreation user numbers differ by alternative, as specified in Chapter 2, Table 2.1. The user numbers for SRMAs, as specified in Table 2.1, are the basis for the analysis of impacts to soils and water resources resulting from foot, non-motorized, and motorized traffic and disturbance; fire; the potential for spread of noxious weeds; and potential for contamination in general.

Table 4.83. Sensitive Soils with Potential to be Impacted by OHV Use, by Alternative

Alternative	Status	Wind-erodible	Water-erodible	Alkalinity	Droughty	Rooting Depth	Salinity	Sodium Adsorp-tion
Alternative A	Acres Open	11,300	8,000	10,450	213,900	262,900	11,100	19,100
	Acres Closed or Limited	28,500	7,900	96,300	476,500	598,000	109,100	120,900
	% of MPA Open	0.6	0.4	0.6	12.0	14.0	0.6	1.0
Alternative B	Acres Open	0	0	0	0	0	0	0
	Acres Closed or Limited	39,750	16,000	106,700	690,700	861,000	120,100	140,000
	% of MPA Open	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Alternative C	Acres Open	210	0	0	370	1,610	0	0
	Acres Closed or Limited	39,500	16,000	106,700	690,300	859,400	120,100	140,000
	% of MPA Open	<0.1	0.0	0.0	<0.1	<0.1	0.0	0.0
Alternative D	Acres Open	270	0	0	1,150	2,700	0	0
	Acres Closed or Limited	39,500	16,000	106,700	689,500	858,300	120,100	140,000
	% of MPA Open	<0.1	0.0	0.0	<0.1	0.1	0.0	0.0

Table 4.84. SRMA Acreage, by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
Acreage of SRMAs	141,234 acres	976,173 acres	658,642 acres	277,471 acres

4.3.13.7.1 ALTERNATIVE A

Under Alternative A, a minimum of 620,212 acres of total soils and 262,000 acres of sensitive soils would be open to cross country OHV travel and associated surface disturbance due to recreation and travel management decisions. Twenty miles of perennial stream and 2,100 acres of riparian resources would be open to OHV travel and associated surface disturbance. If disturbed, these soils would be at risk of erosion and compaction, and water quality could decline. The numbers of acres (and the percentage of all BLM lands) open to cross country OHV use, and the potential for adverse impacts to soils and water resources, is by far the greatest under Alternative A.

Under Alternative A, most of the MPA would be managed as a general Extensive Recreation Management Area (ERMA) rather than as SRMAs, and user numbers would remain at current levels—the highest levels of all alternatives. The least amount of area would be established as SRMAs in Alternative A, and thus impacts to soils and watershed from unmanaged recreation use would continue at the highest rate of any of the alternatives. Recreation decisions under Alternative A would also provide the lowest level of management for recreation resources of any alternative and would, therefore, result in the highest level of adverse impacts to soils and water resources from human-caused surface disturbance, including fire risk and the spread of noxious weeds.

Under Alternative A, dispersed camping would be allowed at the Kane Creek Crossing. This is an adverse impact to soil and water resources in a major floodplain and stream corridor, and a public health and safety risk. Camping in the Bartlett/Tusher/Ten Mile area would also not be closed. This would provide an adverse impact to soil and water resources, because unrestricted camping leads to soil compaction and increased erosion.

4.3.13.7.2 ALTERNATIVE B

Under Alternative B, the largest amount of area would be established as SRMAs, resulting in the greatest control of recreation use of any alternative. This would result in mitigating the greatest amount of potential impacts to soils and watershed from unmanaged recreation use, In addition, limitations on user numbers on the Colorado and Dolores Rivers within SRMAs would be greater than under any other alternative. No open OHV use areas would be designated (see Table 4.83), and camping would be limited to designated areas across much of the MPA, providing the greatest level of protection for soils and water resources of all the alternatives.

The installation of vault toilets in areas of high visitor use would limit adverse impacts to soils and water resources in these areas by keeping the human waste flow from entering the soil and water.

The Bookcliffs SRMA would provide non-mechanized recreation opportunities, with no new motorized routes and no motorized permits, which provides a relatively beneficial impact to soils and water resources in an area with a high density of steep slopes. The Canyon Rims SRMA would provide non-mechanized recreation opportunities, with no new motorized routes. This is a beneficial impact to soils and water resources. The Colorado Riverway SRMA would prohibit camping at the Kane Creek Crossing area. This would provide a relatively beneficial impact in this major floodplain and stream corridor, as well as protect public health and safety. Camping in the Barlett/Tusher/Ten Mile area of the Labyrinth Rims/Gemini Bridges SRMA would be closed, providing a relatively beneficial impact to soil and water resources because the soil compaction and erosion that accompany dispersed camping would not occur.

4.3.13.7.3 ALTERNATIVE C

Under Alternative C, the second largest amount of area would be established as SRMAs, resulting in the second greatest degree of control of potential impacts to soils and watershed. Under Alternative C, more users would be allowed on the Colorado and Dolores Rivers within SRMAs than under Alternative B, but fewer than would be allowed under Alternative A, and Alternative D. Impacts from recreational users would take the forms described under Alternative A, but to lesser degree.

Under Alternative C, all but 1,866 acres of soils be closed or limited to OHV use. This alternative represents fewer protection benefits to soils and water resources than Alternative B, but many more protection benefits than Alternatives A and D (see Table 4.83).

The Canyon Rims SRMA would provide non-mechanized recreation opportunities, with no new motorized routes. This is a beneficial impact to soils and water resources. The Colorado Riverway SRMA would provide responsible camping opportunities at the Kane Creek Crossing area. This would decrease adverse impacts in a major floodplain and stream corridor. Camping in the Bartlett/Tusher/Ten Mile area of the Labyrinth Rims/Gemini Bridges SRMA would not be closed, although it would be restricted to designated sites or campgrounds. This would provide a limited adverse impact to soil and water resources. This alternative is more beneficial than Alternatives A and D but less protective than Alternative B.

4.3.13.7.4 ALTERNATIVE D

Under Alternative D, fewer acres of SRMA would be established, and more impacts to soils and watershed would result from unmanaged recreation use. This is particularly true because the Labyrinth-Gemini area, an area of very high recreation use, would not be managed as an SRMA and impacts to soils and vegetation from unmanaged recreation use would result. In addition, more users—including users of the Colorado and Dolores Rivers—would be allowed than under Alternatives B and C, but less than under Alternative A.

Under Alternative D, all but 3,096 acres of soils would be closed or limited to OHV use This alternative represents fewer protection benefits to soils and water resources than Alternatives B and C, but many more protection benefits than Alternative A (see Table 4.83). No vault toilets would be installed in high visitor use areas, and camping would not be limited to designated

sites, except in a few specific areas, resulting in less protection than Alternatives B and C provide.

The Colorado Riverway SRMA would promote responsible camping opportunities at the Kane Creek Crossing area. This would decrease adverse impacts in a major floodplain. Camping in the Bartlett/Tusher/Ten Mile area would not be closed. This would result in adverse impacts to soil and water resources.

Overall, Alternative D would provide more protection for soils and water resources through recreation management than Alternative A provides, and far less protection than Alternatives B and C would provide.

4.3.13.8 Impacts of Riparian Management Decisions on Soils and Water Resources

Under all action alternatives, no surface disturbance would be allowed within 100 meters of riparian areas, perennial streams and springs, public water reserves, and 100-year floodplains. This would protect soils by reducing erosion and subsequent sedimentation, stabilizing stream banks and floodplains, and improving water quality. Healthy riparian resources are integral to good water resource conditions. Impacts to riparian resources would affect water quality and quantities.

The development and implementation of Watershed Management Plans (WMPs) would benefit soils and water resources because they would emphasize integration of soil and water resource management within basins for which plans are developed. All impacts associated with WMPs are described qualitatively. Generally, the alternatives differ in their development and implementation of the WMPs.

Limitations on livestock grazing in riparian areas would relatively benefit soil and water resources for the reasons described in Section 4.3.13.4.

4.3.13.8.1 Alternative A and D

Alternatives A and D do not direct the development or implementation of any WMPs. Therefore, these alternatives would not provide any of the benefits of these plans to soils and water resources. Livestock grazing would be managed less protectively of riparian resources under Alternatives A and D than under the other alternatives, and would therefore have a greater adverse impact.

4.3.13.8.2 Alternative B

Of all the alternatives, Alternative B would develop and implement WMPs in the greatest number of watersheds, including Mill Creek, Ten Mile Wash, Kane Springs, White Wash, Professor Creek, Negro Bill Canyon, Cottonwood/Diamond, Spring Canyon, Red Wash, Green River, Colorado River, Onion Creek, and Westwater Creek. Alternative B therefore represents the most beneficial impacts to soils and water resources of the forms described under Alternative A because specific management direction would be provided for these watersheds.

Grazing would also be excluded from the following areas: Ten Mile from Dripping Springs to the Green River, Day Canyon, Mill Creek, Seven Mile Canyon, East Coyote, Lower Gray Canyon of the Green River, Kane Springs and Hatch Wash. This is a relatively beneficial impact to 4,422 acres of soils, and 28 miles of perennial stream.

Alternative B would therefore achieve the greatest reduction of adverse impacts to soils and water resources.

4.3.13.8.3 Alternative C

Alternative C would develop and implement WMPs in fewer watersheds than under Alternative B, but more than under Alternatives A and D. WMPs would be developed and implemented in Ten Mile Wash, Kane Springs, Bartlett Wash, Tusher Wash, Mill Canyon, Courthouse Wash, Cottonwood/Diamond, and Onion Creek. Alternative C therefore represents fewer beneficial impacts to soils and water resources than Alternative B, but more beneficial impacts than Alternatives A and D. Impacts would take the forms described under Alternative A.

Grazing would also be restricted in the following areas: Ten Mile from Dripping Springs to the Green River, Day Canyon, Mill Creek, Seven Mile Canyon, and East Coyote, This is a relatively beneficial impact to 1,169acres of soils, and 28 miles of perennial stream.

Livestock grazing would be actively managed on more acres to reduce adverse impacts to soils and water resources, as compared to Alternatives A and D, and on fewer acres as compared to Alternative B. Alternative C therefore provides an intermediate level of protection for soils and water resources.

4.3.13.9 Impacts of Soil and Water Management Decisions on Soil and Water Resources

4.3.13.9.1 Impacts Common to All Alternatives

Under all alternatives, the BLM would comply with all laws to protect municipal watersheds and the watersheds of any public or private water supply. The BLM would continue to manage soils and water resources in accordance with Executive Order 11988, the Clean Water Act, and the Endangered Species Act. These actions would have a beneficial impact of unknown magnitude on soils and water resources. BLM would also coordinate with UDOGM to remediate abandoned mine lands. The beneficial impacts of this remediation upon soils and water resources are discussed in Section 4.3.13.2.

4.3.13.9.2 Impacts Common to All Action Alternatives (B, C, and D)

The BLM would manage soils and water resources in accordance with Utah BLM's Rangeland Health Standards and Guidelines for Grazing and Recreation. This would maintain or improve soil and water conditions, and therefore would provide a beneficial impact common to all action alternatives.

The following management decisions would result in beneficial impacts to soils and water resources by protecting and restoring watershed health, healthy soils and good water quality conditions:

- No surface disturbance within public water reserves, 100-year floodplains, or within 100 meters of natural springs or perennial streams whenever possible, and within 100 m of riparian zones.
- Continue to manage Mill Creek Planning Area in accordance with the Mill Creek Management Plan to provide relatively beneficial impacts on 1,164 acres of soils and 18 miles of perennial streams.

The following management decisions would reduce the accelerated erosion and other impacts associated with surface disturbing activities. This can be considered a relative beneficial impact to soil and water resources.

- BLM management would follow TMDL recommendations in Mill Creek and Onion Creek watersheds, and any other impaired watersheds as defined by the State of Utah and the current 303d list of impaired waters. These recommendations refer to improving water quality conditions to meet state standards.
- Any proposed surface disturbing activities, especially those located in sensitive soils (see Table 4.78) would incorporate BMPs and other mitigation measures to minimize soil erosion and maintain soil stability.
- Continue to require the Grand County Water Conservancy District to leave 3 cfs of stream flow in Mill Creek, downstream of the Sheley Tunnel diversion structure, providing a relatively beneficial impact to 6 miles of perennial streams.
- Apply a timing limitation to oil and gas leasing and other surface disturbing activity prohibiting activities on moderate to highly saline soils (313,800 acres) from December 1 to March 31. This restriction includes road construction and traffic on existing roads associated with drilling operations.
- Erosion control practices for slopes greater than 20% would follow Utah's Nonpoint Source Management Plan (UDEQ 2001). A controlled surface use stipulation would be applied to oil and gas leases and other surface disturbing activities on slopes in the Bookcliffs that are greater than 30% from November 1 to April 30.
- Guidelines from Technical Reference 1730-2 (BLM 2001d, as revised) regarding biological soil crusts would be applied or followed where feasible, These decisions would reduce impacts to biological soil crusts and would constitute a beneficial impact.
- Pipeline crossings would be constructed as recommended in the Guidance for Pipeline Crossings (Appendix H)
- The prohibition of new OHV routes saline soils (not in the proposed travel plan) would beneficially impact soils and watersheds by not accelerating the natural rate of erosion, therefore providing a relative beneficial impact to soil and water resources.

4.3.13.9.3 IMPACTS VARYING BY ALTERNATIVE

The primary municipal watersheds of concern in the MPA include the Castle Valley watershed aquifer system (a sole-source, unconfined surficial aquifer), the Thompson watershed, and the Mill Creek watersheds. These watershed sources provide drinking water for the towns of Castle Valley, Thompson and Moab respectively, as well as for the surrounding inhabited areas. Surface disturbance could lead to contamination of groundwater and surface waters by sediment and hazardous materials. Changes in surface hydrology due to road building would also have adverse impacts to these watershed resources, where rates of infiltration peak runoff would increase, causing lower rates of infiltration, increased peak runoff and higher rates of soil erosion. Generally, the elimination of surface-disturbing activities upstream of public water reserves would reduce adverse impacts to soils and water resources.

Under some alternatives, road construction and traffic associated with drilling operations would be prohibited seasonally in areas with saline soils underlain by Mancos Shale when wet soils are most susceptible to impacts. These timing limitations would protect soils and water resources by reducing accelerated rates of erosion preventing erosion of the moderate to highly saline soils associated with the Mancos Shale and reducing subsequent contamination of water resources.

Development of Allotment Management Plans (AMPs) and use of grazing systems would be beneficial to soils and water resources. The areas prioritized for AMPs vary by alternative, based on soil and water resource concerns. Because the development of AMPs is also proposed as a Livestock Management action, these impacts are discussed in Section 4.3.13.4.

The development of Watershed Management Plans (WMPs) would also be beneficial to soil and water resources. Because the development of WMPs is also proposed as Riparian Management, these impacts are discussed in Section 4.3.13.8.

4.3.13.9.3.1 Alternative A

Alternative A does not include specific decisions regarding oil and gas leasing or other surface-disturbing activities in the Castle Valley aquifer or the Mill Creek municipal watersheds. These water sources would therefore be subject to impacts such as surface disturbance and contamination of shallow groundwater by well drilling and changes in surface hydrology due to road building and access to lease areas, which would have and adverse impact on soils and water resources in these watersheds. (The Castle Valley municipal watershed totals 10,321 BLM acres; the Mill Creek municipal watershed not encompassed by the Mill Creek WSA totals 9,667 BLM acres.)

There is no restriction on new motorcycle routes on saline soils in Alternative A. This would have an adverse impact on soil and water resources because soil compaction and erosion would result.

4.3.13.9.3.2 Alternatives B and C

Alternative B would close the Castle Valley and Mill Creek municipal watersheds to oil and gas leasing and other surface-disturbing activities. These closures would protect these surface waters and shallow aquifers from potential impacts such as contamination with drilling fluids and sedimentation within these watersheds, and impacts described under Alternative A would be prevented under Alternatives B. This alternative would provide more protection for these watersheds than does Alternative A.

Alternative C would implement a no surface occupancy stipulation for oil and gas leasing and other surface disturbing activities within the Castle Valley and Mill Creek municipal watersheds. This limitation would protect these surface waters and shallow aquifers from potential impacts such as contamination with drilling fluids and sedimentation within these watersheds, and impacts described under Alternative A would be prevented under Alternative C.

Under Alternatives B and C, a timing limitation would be applied to 330,142 acres of certain sensitive soils (saline or highly wind erodible) prohibiting surface-disturbing activities from December 1 to May 31. Additionally, road construction and use would be limited in these areas from December 1 to May 31, thus reducing short- and long-term, adverse impacts to soils and water resources. Alternatives B and C therefore provide more protection to sensitive soils, by area, than Alternatives A and D. Overall, Alternatives B and C would provide the greatest protection for soils and water resources.

4.3.13.9.3.3 Alternative D

Impacts regarding the Castle Valley and the Mill Creek municipal watersheds would be the same as under Alternative A.

Under Alternative D, no timing limitations would be applied to surface disturbance of moderately and highly saline soils. Therefore, Alternative D would result in adverse impacts to saline soils and water quality compared to Alternative A and would be the most adverse of all the alternatives.

4.3.13.10 Impacts of Special Designation Decisions on Soils and Water Resources

Although ACEC designation alone does not necessarily provide protection, special management attention designed for each ACEC often limits surface-disturbing activities, thereby protecting soils and water resources. Protections associated with ACEC designation that would affect soils and water resources include no surface occupancy stipulations, travel limitations, and grazing restrictions. Because of the complexity of the proposed ACECs' management criteria, their effects are addressed more generally under each of the alternatives.

Under all alternatives, the management of Wilderness Study Areas (WSAs) would be consistent with the BLM's Interim Management Policy (1995), which does not allow any motorized use or surface disturbance within WSAs. Thus, no impacts to soils or water resources would occur within these areas under any alternative. Transportation and OHV management within WSAs

varies between alternatives. These impacts are included in the discussion in Section 4.3.13.7 (Impacts of Recreation and Travel Management on Soils and Water Resources).

Under all alternatives, designating specific river segments as Wild under the Wild and Scenic Rivers Act would uniformly, beneficially impact soils and water resources, as it would protect sensitive soils. The designation of river segments as Wild would limit surface-disturbing activities within 1/4 mile of those river segments, which in turn would limit potential decreases in soil productivity and potential increases in sedimentation of surface waters. These protections (where proposed) would overlap riparian management prescriptions preventing surface disturbance within 100 meters of riparian areas, springs, and 100-year floodplains.

The total number of river miles designated as Wild varies by alternative, as does the total number of acres of sensitive soils adjacent to those river segments (Table 4.85).

Table 4.85. Acres of Sensitive Soils adjacent to River Segments Eligible for WSR Designation as Wild, by Alternative

	A	B		C		D	
Limiting Factor	Acres	Acres	± Compared to Alternative A	Acres	± Compared to Alternative A	Acres	± Compared to Alternative A
Wind-erodible	0	3,100	+3,100	2,700	+2,700	0	0
Water-erodible	300	1,300	+1,000	700	+400	0	-300
Alkalinity	0	100	+100	0	0	0	0
Droughty	5,400	40,800	+35,400	25,900	+20,500	0	-5,400
Rooting Depth	1,800	30,300	+28,500	18,400	+16,600	0	-1,800
Salinity	0	100	+100	0	0	0	0
Sodium Adsorption	0	200	+200	100	+100	0	0

4.3.13.10.1 ALTERNATIVE A

Under Alternative A, no additional areas would be designated as ACECs, so no additional areas would be be benefically or adversely impacted by ACEC management prescriptions. Under Alternative A, no river segments would be determined suitable. However, all eligible rivers would continue to be managed as eligible under this alternative with the tentative classifications currently identified. Approximately 5,400 acres of sensitive soils are within 1/4 mile of the eligible river segments. These acres would continue to be protected from surface disturbance under Alternative A

4.3.13.10.2 ALTERNATIVE B

All of the 14 proposed areas would be designated as ACECs under Alternative B. Special management attention prescribed for ACECs during planning varies by ACEC. Where management would limit surface disturbance (for example, by closing or limiting motorized

routes, placing limitations on recreational activities, placing limitations on mineral development activities, etc.) it would provide protection for soils and water resources. The Cottonwood-Diamond Watershed ACEC, in particular, would protect public health and safety by protecting soil and water resources and floodplains.

Because Alternative B would designate all 14 proposed areas as ACECs, it would result in the greatest amount of protection for soils and water resources compared to Alternatives A, C, and D. 609,687 acres of soils, 398,318 acres of sensitive soils and approximately 100 miles of perennial stream would be protected due to ACEC designation and associated management.

Under Alternative B, the designation of river segments as suitable with a tentative classification as Wild would limit surface disturbance on 40,800 acres of sensitive soils adjacent to these segments. Designation of eligible segments as suitable in Alternative B, no matter what their tentative classification, would help protect 340 miles of perennial streams. Therefore, WSR designation decisions under Alternative B have the potential to provide the most protection to sensitive soils of all the alternatives.

4.3.13.10.3 Alternative C

Under Alternative C, 5 of the 14 proposed areas would be designated as ACECs. Impacts would be similar to Alternative A for those areas not proposed, and similar to Alternative B for those that are designated. Alternative C would therefore provide more protection of soil and water resources trough ACEC designation than Alternatives A and D but less than Alternative B. Under Alternative C, the designation of one river segment as Wild would limit surface disturbance on approximately 25,900 acres of sensitive soils adjacent to these segments, and protect 185 miles of perennial stream. Therefore, WSR designation decisions under Alternative C have the potential to provide protection to more acres of sensitive soils than Alternatives A and D, but to fewer acres than Alternative B

ACEC management would protect 63,232 acres of soils, 33,672 acres of sensitive soils and 15 miles of perennial streams under this alternative.

4.3.13.10.4 Alternative D

As with Alternative A, no additional ACECs would be designated under Alternative D. No river segments would be designated and managed as suitable for congressional wild and scenic river designation under Alternative D; therefore, no protections for soils and water resources adjacent to any river segment would occur.

4.3.13.11 Summary of Impacts

The management of many resources within the MPA would have the potential to impact soils and water resources. Impacts related to fire management and health and human safety would have the same impacts for all alternatives. Impacts related to cultural resources, livestock grazing, mineral and utility corridor development, non-WSA lands with wilderness characteristics, recreation and travel, riparian, and special designations would have varying

degrees of impact on soils and water resources. Table 2.2 (of Chapter 2) outlines the potential impacts for each alternative due to resource management.

Generally, the greatest level of adverse impacts to soils and water resources would occur under Alternatives A and D, and the lowest level of impacts would occur under Alternative B. Alternative C would generally have an intermediate level of impacts.

The most significant difference between alternatives in terms of impacts to soils and water would be due to livestock grazing management, minerals development decisions, and the regulation of OHV use.

4.3.14 SPECIAL DESIGNATIONS

This section discusses impacts to areas of special designation from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning special designations are described in Chapter 3.

Special designations include Areas of Critical Environmental Concern (ACECs), a National Historic Trail (Old Spanish Trail), and Wild and Scenic Rivers (WSRs). The management of ACECs focuses on protecting specific relevant and important values. The management of the National Historic Trail seeks to enhance public enjoyment and understanding of the Old Spanish National Historic Trail. For river segments that are eligible/suitable for congressional designation as WSRs, management focuses on protecting specific, identified, outstandingly remarkable values, and the tentative classification and free-flowing character.

Wilderness Study Areas (WSAs) and Wilderness Areas (WAs) are also special designations that were previously established by law and policy. Nothing in this RMP will change these designations. There are eleven Wilderness Study Areas and one Wilderness Area (Black Ridge) in the MPA. The management of wilderness (WSAs and WAs) focuses on maintaining the wilderness characteristics of appearance of naturalness, outstanding opportunities for solitude and/or primitive, unconfined recreation, and size and guidelines have already been established for managing these areas. The only decisions that will be made in the RMP for WSAs are: OHV designations, route designations, and VRM designations. There are no decisions to be made for the Black Ridge Wilderness

4.3.14.1 ASSUMPTIONS

Some areas within the MPA may have two or more special designations. Any potential ACEC or WSR-eligible river segment that falls within a WSA[4] would be managed under the IMP, which strictly regulates surface disturbance[5] and protects the "relevant and important values" (in the case of an ACEC) or "eligibility" (in the case of a WSR) of the area. WSAs are closed to mineral leasing and development and most other surface-disturbing activities. Because WSA restrictions

[4] Some river segments border WSAs. Depending on the WSA border description, some of the area suitable for WSR designation would likely be within the WSA.
[5] Subject to valid rights existing at the time of the enactment of FLPMA.

on surface-disturbing activities would generally protect the relevant and important values of potential ACECs, as well as the outstanding remarkable values of WSRs, the following analyses assume that WSAs have a beneficial impact on other lands considered for special designations. Because the management of WSAs is often more restrictive than the management of ACECs, the designation of an ACEC where a WSA already exists often does not provide significant additional resource protection.

In addition to protecting scenic resources (see Section 4.3.14), Visual Resource Management (VRM) designation of an area influences the surface-disturbing activities that can take place. VRM Class I is the most restrictive, allowing virtually no surface-disturbing activity. VRM Classes II and III allow little to moderate surface disturbance, respectively, and VRM Class IV generally does not restrict surface disturbance. The following analyses therefore assume that more restrictive VRM Classes (I and II) are more beneficial to the values of specially-designated areas than less restrictive classes, since they serve to protect scenic resources and reduce surface disturbance.

Lands managed for wilderness characteristics would protect natural resource values by limiting surface disturbing activities. These lands would be managed as closed or with a NSO stipulation for oil and gas and other surface disturbing activities. Lands with wilderness characteristics would be closed to woodcutting and travel would be limited to designated routes. The management prescription for these areas would enhance the relevant and important values within an ACEC, and the outstandingly remarkable values within a WSR segment.

Under all alternatives, mineral leasing would be conducted primarily for oil and gas within seven Reasonable Foreseeable Development (RFD) areas, which cover the entirety of the MPA except for WSAs. (WSAs are closed to mineral leasing by law and policy, which is the same for all alternatives.) The level of development in each RFD area varies from alternative to alternative and from special designation to special designation (e.g., ACECs, WSRs). Under all alternatives, areas designated as open to leasing with standard lease terms and open to leasing with timing limitation and controlled surface use stipulations are most likely to experience surface-disturbance due to oil and gas development. Therefore, the following analyses assume that acreage closed to leasing or managed with a no surface occupancy (NSO) stipulation for mineral leasing generally benefit areas considered for special designations by reducing or eliminating mineral development and associated resource impacts, such as surface disturbance. Conversely, the analyses assume that areas open to mineral leasing under standard terms or timing limitation/controlled surface use stipulations would be adversely impacted by mineral development.

Under Alternative A, all lands outside WSAs are open to the disposal of salable minerals. However, the disposal of salable minerals is not anticipated in these areas. Under Alternatives B, C and D, salable minerals are subject to the stipulations governing oil and gas leasing and other surface disturbing activities. This means that a NSO stipulation closes land to salable mineral disposal.

Under all action alternatives, the imposition of a closed or NSO stipulation for oil and gas leasing would preclude all other surface disturbing activities, with the exception of locatable mineral development.

Under all alternatives, all public lands within the MPA are open to mining claim location unless they are within an existing withdrawal. It is possible that mining claims could be located in areas proposed for Special Designation (eligible rivers for Congressional WSR designation, or ACECs). Wilderness Areas are withdrawn by Congress. Mining claims can be located within WSAs, but development is subject to the non-impairment standard. Except where WSAs are in place and where development of claims would be subject to a non-impairment standard, claimants could conduct operations that would adversely impact the resources of concern. Locatable mineral development would be subject to timing limitations and controlled surface use stipulations. However, development in these areas is not anticipated, and therefore, for this analysis, it is assumed that adverse impacts to these areas from locatable mineral development would not occur

In general, the following analyses assume that woodland harvest would adversely affect the values of lands considered for special designations by increasing surface disturbance and human-related disturbance. However, the low level of woodland harvest in the MPA minimizes the adverse impacts to these areas.

Except for Alternative A, NSO areas are avoidance areas for rights of way; closed areas are exclusion areas for rights of way. Rights of way are issued for roads, pipelines, powerlines, wind and solar power sites, and communication sites. Rights of way in avoidance areas would only be granted if there are no feasible alternatives. Therefore, the following analyses assume that rights of way would not be placed within NSO or closed areas in any of the action alternatives. Rights of way could be granted in potential Special Designation areas under Alternative A.

Except for Alternative A, where a NSO stipulation does not preclude other surface disturbing activities, NSO areas are avoidance areas for rights-of-way; closed areas are exclusion areas for rights of way. Rights of way are issued for roads, pipelines, powerlines, wind and solar power sites, and communication sites. Rights-of-way in avoidance areas would only be granted if there are no feasible alternatives. Therefore, the following analyses assume that rights-of-way would not be placed within NSO or closed areas in any of the action alternatives. Rights-of-way could be granted in potential Special Designation areas under Alternative A, except where WSAs or designated wilderness exist.

Except for Alternative A, OHV use would be limited to designated routes unless otherwise specified. The following analyses assume that this would have beneficial impacts to the values of areas considered for special designations by eliminating surface disturbance from cross-country travel. Limiting OHV use to designated routes throughout the MPA would also likely result in fewer instances of inadvertent, casual, or deliberate illegal riding off designated routes, and would consequently also decrease the risk of impacts to resources within areas considered for special designations.

4.3.14.2 AREAS OF CRITICAL ENVIRONMENTAL CONCERN (ACECS)

ACECs are designated to provide special management attention to "relevant and important" values, resources, natural systems, and natural hazards, including the following, which are found in the MPA:

- Rare or relict plant species
- Special status plant, fish, and animal species (designated as threatened, endangered, or candidate by the USFWS, or as sensitive by the BLM)
- Important wildlife habitat
- Riparian areas
- Watersheds and other natural systems (e.g., flash flood hazards)
- Dune systems and sensitive soils
- Cultural resources (historical or prehistoric)
- Paleontological resources
- Scenic (i.e., visual) resources
- Natural hazards

Most of these are also resources in their own right requiring management and planning via this Draft RMP/EIS, so they are discussed in greater detail at the planning area-wide level in other sections of this Draft RMP/EIS. Therefore, the impacts analysis presented in this section focuses on comparisons among the alternatives, based largely on the assumptions described in the section above. More detailed analyses of the impacts of particular management decisions on specific relevant and important resource values can be found under each specific resource section. For example, the effects of watershed management decisions on riparian areas can be found in Section 4.3.11 (Environmental Consequences of Alternatives, Riparian).

As stated above, any section(s) of a potential ACEC that falls within a WSA would be managed under the BLM's Interim Management Policy for Lands Under Wilderness Review (IMP), which strictly regulates surface disturbance and impacts that would alter the area's wilderness characteristics (appearance of naturalness and outstanding opportunities for solitude and primitive and unconfined recreation) One of the practical effects of this interim management is that permitted activities in WSAs (except grandfathered uses and valid existing rights) are limited to temporary uses that create no new surface disturbance, nor involve permanent placement of structures. (H-8550-1 Interim Management Policy for Lands Under Wilderness Review; BLM 1995). All prescriptions for ACEC/WSA overlap areas must comply with the IMP. Since the IMP imposes these special management conditions, it is assumed that there would be no impacts to the relevant and important values in the overlap areas and that ACEC management would be duplicative in most instances. Table 4.86 lists the ACECs with the percent of WSA overlap.

Table 4.86. Acres ACEC Designated and % WSA by Alternative

ACECs	Alternative A (No Action)		Alternative B		Alternative C		Alternative D	
	Acres	% WSA	Acres	% WSA	Acres	% WSA	Acres	% WSA
Behind the Rocks	0	NA	17,836	73%	5,201	0%	0	NA
Book Cliffs	0	NA	304,252	81%	0	NA	0	NA
Canyon Rims	0	NA	23,400	0%	0	NA	0	NA
Cisco White-tailed Prairie Dog Complex	0	NA	117,481	0%	0	NA	0	NA
Colorado River Corridor	0	NA	50,483	5%	0	NA	0	NA
Cottonwood-Diamond Watershed	0	NA	35,830	93%	35,830	93%	0	NA
Hwy 279/Shafer Basin/Long Canyon	0	NA	13,500	0%	13,500	0%	0	NA
Labyrinth Canyon	0	NA	8,528	0%	0	NA	0	NA
Mill Creek Canyon	0	NA	13,501	58%	3,721	0%	0	NA
Ten Mile Wash	0	NA	4,980	0%	4,980	0%	0	NA
Upper Courthouse	0	NA	11,529	0%	0	NA	0	NA
Westwater	0	NA	5,069	98%	0	NA	0	NA
White Wash	0	NA	2,988	0%	0	NA	0	NA
Wilson Arch	0	NA	3,700	0%	0	NA	0	NA
Total	**0**	**NA**	**613,077**	**50%**	**63,232**	**53%**	**0**	**NA**

Any section(s) of a proposed or existing ACEC that falls within a WSA would be managed under the BLM's *Interim Management Policy for Lands Under Wilderness Review* (IMP), which strictly regulates surface disturbance and impacts that would alter the naturalness, primitiveness and solitude of the area. One of the practical effects of this interim management is that permitted activities in WSAs (except grandfathered and valid existing rights) are limited to temporary uses that create no new surface disturbance, nor involve permanent placement of structures. (H-8550-1 Interim Management Policy for Lands Under Wilderness Review; BLM 1995). All prescriptions for ACEC/WSA overlap areas must comply with or have a greater protective emphasis than those imposed by the IMP. Since the IMP imposes these special management conditions, it is assumed that there would be no impacts to the relevant and important values in the overlap areas and that ACEC management would be duplicative in most instances. Table 4.86 lists the ACECs with the percent of WSA overlap.

No beneficial or adverse impacts to these relevant and important values, resources, natural systems or hazards of the potential ACECs in the MPA would result from management decisions regarding air quality, or fire management.

Twelve of the fourteen Potential ACECs have acreage that is leased for oil and gas under stipulations developed in earlier RMPs. These oil and gas leases would remain valid until they expire (leases are issued for ten years). While all leases do not proceed to development, stipulations developed in this RMP for oil and gas leasing would not apply to leases issued under previous RMPs. Table 4.87 predicts the number of wells that could be drilled under valid existing leases, by Potential ACEC.

Table 4.87. Potential ACECs, Number of Wells Predicted, and Currently Leased Acreage

Name of Potential ACEC	Total Acreage in ACEC	Acreage under Existing Leases	Percentage of Potential ACEC under Lease	RFD Area	Number of Wells Predicted under Existing Leases
Behind the Rocks	17,836	45	<1.0	Big Flat-Hatch Point	<1.0
Bookcliffs Wildlife	304,252	41,933	14	Bookcliffs	28.9
Canyon Rims	23,400	9,348	39	Big Flat-Hatch Point	1.2
Cisco White Tailed Prairie Dog	117,481	58,846	50	Greater Cisco	53.5
Colorado River Corridor	50,483	1,168	2	Eastern Paradox	0.07
Cottonwood-Diamond Watershed	35,830	1,592	4	Bookcliffs	1.1
Highway 279/Shafer Basin/Long Canyon	13,500	2,944	22	Big Flat-Hatch Point	0.37
Labyrinth Canyon	8,528	41	0.48	Big Flat - Hatch Point	0.005
Mill Creek Canyon	13,501	130	0.96	Eastern Paradox	0.0078
Ten Mile Wash	4,980	6	0.12	Big Flat-Hatch Point	<.01
White Wash	2,988	1,821	61	Salt Wash	0.43
Wilson Arch	3,700	2,624	71	Lisbon Valley	1.3

Two potential ACECs, Bookcliffs and Greater Cisco, have 28 and 53 wells predicted that could be drilled under valid existing rights. This could adversely impact the relevant and important values found in these ACECs. Three potential ACECs (Canyon Rims, Cottonwood-Diamond and Wilson Arch) have around one well predicted, which could have a minor adverse impact to the relevant and important values found in these ACECs. On the remainder of the ACECs, fewer

than one well is predicted. This would not adversely impact the relevant and important values of the ACEC in question.

4.3.14.2.1 Behind the Rocks Potential ACEC (17,836 Acres)

If designated, the Behind the Rocks Potential ACEC would be managed to preserve the relevant and important special status and relict plant species, cultural and scenic values where designated (Alternatives B and C).

The Behind the Rocks Potential ACEC would be managed to preserve the relevant and important values of special status and relict plant species, cultural resources, and scenery where designated (Alternatives B and C).

Approximately 12,836 acres of the potential ACEC overlaps with the Behind the Rocks WSA. This would result in beneficial impacts to the ACEC, as described above. The area would also be within the Colorado Riverway Special Recreation Management Area (SRMA). SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC.

4.3.14.2.1.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the Behind the Rocks Potential ACEC would not be designated an ACEC. The 5,201 acres of the proposed Behind the Rocks ACEC that do not overlap the Behind the Rocks WSA would not receive any special designation, and would be managed under the following stipulations:

- OHV use would be limited to existing routes.
- Rights-of-way could be approved outside the WSA.
- Manage as VRM inventory class.
- Oil and gas leasing would be closed on 3,652 acres. About 1,958 acres would be managed as no surface occupancy for oil and gas leasing, while about 694 acres would be open under standard lease terms.

Based on projections of oil and gas development in the Big Flat/Hatch Point RFD area, approximately 7.3 acres of surface disturbance within the proposed ACEC are likely to occur over the life of the plan (Table 4.88). This surface disturbance would detract from scenic values.

Table 4.88. Acres of Behind the Rocks Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Behind the Rocks	7.3	0.0	0.0	7.0

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.1.2 Alternative B (17,836 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 17,836 acres proposed would be designated and managed as an ACEC. Of this acreage, 12,635 acres are within the Behind the Rocks WSA, and 4,231 acres of non-WSA lands (in Hunter Canyon and Behind the Rocks) would be managed for wilderness characteristics. This decision would result in the greatest beneficial impacts to the relevant and important values of the ACEC.

Management prescriptions on the entire area of the ACEC would generally be more beneficial than under Alternative A, and would include:

- Limiting OHV use to designated routes.
- Restricting vehicle-based camping to campgrounds and not allowing campfires outside of campgrounds.
- Closing the area to surface disturbing vegetation treatments except for treatments of noxious weeds and exotics.
- Closing the area to woodland harvest.
- Designating as VRM Class I.
- Prioritizing Class III inventories for cultural resources.
- The 12,635 acres within the Behind the Rocks WSA would be managed under IMP.
- Manage the 12,635 acres within the WSA and the wilderness characteristics acreage (4,231 acres) as closed to oil and gas leasing. About 970 acres outside the WSA or wilderness characteristics area are managed as no surface occupancy for oil and gas leasing which precludes other surface disturbing activities. The closed area is an exclusion area for rights-of-way, and the NSO area is an avoidance area for rights-of-way.

Prioritizing Class III inventories for cultural resources would have a beneficial impact by identifying significant cultural sites so that management efforts can be taken to prevent damage from activities from other management programs

Alternative B would have the least adverse impacts from oil and gas development (Table 4.88), and from all other surface disturbing activities.

4.3.14.2.1.3 Alternative C (5,201 Acres Proposed for ACEC Designation)

Under Alternative C, 5,201 acres of the potential ACEC would be designated and managed as an ACEC. None of these acres are within the Behind the Rocks WSA. Of these 5,201 acres, 4,231 acres of non-WSA lands are managed for wilderness characteristics. Management of the ACEC is similar to that described for Alternative B, except that the ACEC would be managed as VRM Class II[6] and the 4,231 acres with wilderness characteristics would be managed as NSO for oil and gas leasing as well as precluding other surface disturbing activities. The impacts to the potential ACEC from Alternative C would be essentially the same as under Alternative B. This is

[6] Barring any prior existing rights, no oil and gas related surface disturbance is projected to occur.

because the portion not designated would continue to be protected as a WSA, and management of the designated area as NSO for oil and gas leasing would also strictly limit all other surface disturbing activities. As a result, the impacts to the ACEC from Alternative C would be essentially the same as under Alternative B.

4.3.14.2.1.4 Alternative D (0 Acres Proposed for ACEC Designation)

Under Alternative D, zero acres would be designated as Behind the Rocks ACEC Although the WSA portion would be protected by the IMP, the 5,201 acres outside of the Behind the Rocks WSA would not be so protected. Although vehicle travel would be limited to designated routes, which is protective of the surface, in the non-WSA portion approximately 5,000 acres would be available for oil and gas leasing and development, which, along with a VRM Class III designation which allows for noticeable disturbance, could put scenic and cultural values and plant resources at risk in a portion of the potential ACEC. Based on projections of oil and gas development, approximately 7.0 acres of surface disturbance within the proposed ACEC are likely to occur over the life of the plan (Table 4.88). Therefore, Alternative D would have similar, although slightly less, potential for adverse impacts to the relevant and important values and resources of the ACEC than Alternative A.

4.3.14.2.2 Book Cliffs Potential ACEC (304,252 Acres)

If designated, the Book Cliffs Potential ACEC would be managed to preserve the relevant and important cultural resources, and important habitat for wildlife (i.e., Rocky Mountain bighorn sheep, mule deer, and elk) values where designated (Alternative B).

Approximately 250,207 acres of the potential ACEC overlap with the Desolation, Flume, Floy, Coal, and Spruce WSAs. All acreage within the WSAs would be managed as VRM I.

4.3.14.2.2.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the Book Cliffs ACEC would not be designated. The 54,045 acres of the proposed Book Cliffs ACEC that are not within WSAs would not receive any special designation, and would be managed under the following stipulations:

- Allow woodland harvest.
- Rights-of-way could be approved outside the WSAs.
- OHV use would be managed as open or limited to existing routes.
- Leasable mineral development would be allowed on 15,757 acres with standard lease terms, and on 38,415 acres with timing limitations and controlled surface use stipulations. Other surface disturbing activities, including salable mineral development, would be precluded.

Based on projections of oil and gas development in the Book Cliffs, Roan Cliffs, Eastern Paradox and Greater Cisco RFD areas, approximately 841 acres of surface disturbance within the proposed ACEC (1.6% of the potential ACEC outside the WSAs) are likely to occur over the life of the plan (Table 4.89). This surface disturbance would impact wildlife habitat values.

Table 4.89. Acres of Book Cliffs Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Book Cliffs	841.0	0.0	805.9	805.9

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.2.2 Alternative B (304,252 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 304,252 acres proposed would be designated and managed as an ACEC. This management decision would result in the greatest beneficial impacts to the relevant and important values of the ACEC. The area would also be within the Bookcliffs and Lower Gray Canyon SRMAs. SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC. Alternative B management prescriptions would beneficially impact the ACEC area more than Alternative A by:

- Restricting OHV use to designated routes.
- Closing the area to harvesting woodland products.
- Of the 54,405 acres outside the WSA, 34,363 acres are managed with a no surface occupancy stipulation for oil and gas leasing and other surface disturbing activities. The remaining 19,901 acres of non-WSA lands (in Coal Canyon, Desolation Canyon, Floy Canyon, Spruce Canyon and Mexico Point) are managed to protect wilderness characteristics and are closed to oil and gas leasing. Thus, no adverse impacts due to oil and gas development are expected under this alternative (Table 4.89).
- Prioritizing Class III inventories for cultural resources.
- The 249,988 acres within the WSAs would be managed under IMP and would be closed to oil and gas leasing.
- Designate the 19,901 acres with wilderness characteristics as VRM Class II. All areas of the proposed ACEC within a WSA would be designated as VRM Class I.

4.3.14.2.2.3 Alternatives C and D (0 Acres Proposed for ACEC Designation)

Under Alternatives C and D, the Book Cliffs Potential ACEC would not be designated. The 54,045 acres of the proposed Book Cliffs ACEC that are not within WSAs would not receive any special designation. In addition, no acres would be managed to protect wilderness characteristics. The area would be managed under the same management prescriptions as Alternative A, with the following exceptions:

- Approximately 1,800 acres outside the WSAs along the Green River would be closed to woodland harvest.

- All mineral development would be subject to timing restrictions. The total acreage likely to be disturbed by mineral resource development would be 805.9 acres, or 1.5% of the potential ACEC lands that are outside the WSAs (Table 4.89).
- All OHV use would be limited to designated routes.
- Rights-of-way could be granted anywhere outside the WSA.

Because of these exceptions, the overall net impacts to the relevant and important values in this area due to Alternatives C and D would be adverse compared to Alternative B, but beneficial compared to Alternative A. Wildlife values could be adversely impacted by the habitat fragmentation and disruption caused by surface disturbing activities.

4.3.14.2.3 Canyon Rims Potential ACEC (23,400 Acres)

If designated, the Canyon Rims Potential ACEC would be managed to preserve relevant and important scenic values where designated (Alternative B).

Under all alternatives, the potential Canyon Rims ACEC is within the Canyon Rims SRMA, SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC.

4.3.14.2.3.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the proposed Canyon Rims ACEC would not be designated, but would continue to be managed as a SRMA. The majority of the area would be designated as VRM Class II, and mineral development would be allowed with controlled surface use stipulations to protect visual resources.

Based on projections of oil and gas development in the Big Flat/Hatch Point RFD area, approximately 33.2 acres (0.1% of the potential ACEC lands) of surface disturbance within the proposed ACEC are likely to occur over the life of the plan (Table 4.90).

Table 4.90. Acres of Canyon Rims Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Canyon Rims	33.2	0.0	24.0	31.7

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

Adverse impacts to the relevant and important value in this area (i.e., scenic resources) would be caused by mineral, development and the development of rights of way. No adverse impacts to the relevant and important value would result from recreation decisions, since the area is n SRMA; camping would be limited to designated sites, and routes for motorized events and motorized, mechanized, and non-mechanized sight-seeing would be delineated.

4.3.14.2.3.2 Alternative B (23,400 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 23,400 acres proposed would be designated and managed as an ACEC. Of this acreage, 3,417 acres of non-WSA lands (in Harts Point and Hatch/Lockhart) would be managed for wilderness characteristics and would be closed to oil and gas leasing. The remaining area would be managed with a NSO stipulation for oil and gas leasing. Because the entire area is either closed or NSO, no oil and gas development is expected under this alternative (Table 4.90), compared to the 33 acres projected in Alternative A. In addition, other surface disturbing activities, including salable mineral development, would be precluded in the entire ACEC. Motorized or mechanized vehicles would be limited to designated routes, and no new routes would be allowed. As a result of the above management prescriptions, Alternative B would increase protection of scenic values over Alternative A.

4.3.14.2.3.3 Alternatives C and D (0 Acres Proposed for ACEC Designation)

Under Alternatives C and D, none of the Canyon Rims Proposed ACEC would be designated as an ACEC. It would be managed as an SRMA. These alternatives would utilize the same management prescriptions as Alternative A, with the following exceptions:

- A portion of the area (943 acres in Alternative C and 2,266 acres in Alternative D) would be subject to standard lease terms. The remainder of the area would be subject to a controlled surface use stipulation to protect visual resources. The total acreage of ACEC lands likely to be disturbed by oil and gas development would be 24.0 acres under Alternative C and 31.7 acres under Alternative D (Table 4.90).
- A portion of the area (943 acres in Alternative C and 2,266 acres in Alternative D) would be designated VRM Class III. As a result, the viewshed from the top of the canyon could be negatively affected by surface-disturbing activities.
- OHV use would be limited to designated routes.
- Due to the exceptions above, Alternatives C and D would result in less adverse impacts to the relevant and important value of scenery than Alternative A, but greater adverse impacts than Alternative B.

4.3.14.2.4 Cisco White-tailed Prairie Dog Complex Potential ACEC (117,481 Acres)

If designated, he Cisco White-tailed Prairie Dog Complex ACEC would be managed to preserve the relevant and important value of wildlife where designated (Alternative B).

4.3.14.2.4.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the Cisco White-tailed Prairie Dog Complex would not be designated as an ACEC. The area would be managed under the following actions:

- OHV use would be managed as open or as limited to existing routes.

- Leasable and salable mineral development would be primarily open under standard and special stipulations, with less than 1% of lands in this ACEC area being subject to no surface occupancy.
- The area would be open to rights-of-way development
- There are no visual resource management classes.

Based on projections of oil and gas development in the Greater Cisco, Book Cliffs and Eastern Paradox RFD areas, approximately 1,249 acres of surface disturbance (1.1% of the potential ACEC lands) within the proposed ACEC are likely to occur over the life of the plan (Table 4.91).

Table 4.91. Acres of Cisco White-tailed Prairie Dog Complex Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Cisco White-tailed Prairie Dog Complex	1,248.5	0	1,255.4	1,256.5

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.4.2 Alternative B (117,481 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 117,481 acres proposed would be designated and managed as an ACEC. Management prescriptions would be tailored to enhance habitat for the white tailed prairie dog. The BLM would work with the UDWR and the USFWS to protect the species. OHV use would be restricted to designated routes, and no new routes for mechanized or mechanical travel would be allowed. Mineral leasing would be managed with a no surface occupancy stipulation. Because the entire area is managed as NSO, no oil and gas development is expected under this alternative (Table 4.91), compared to the 1,249 acres projected in Alternative A. Other surface disturbing activities, including salable mineral development, would be precluded. Allotment Management Plans for grazing would be revised, which could include changing season of use, to protect prairie dog habitat.

Surveys for prairie dogs would be conducted prior to surface-disturbing activities in addition to other avoidance and other mitigating measures. These measures would reduce the adverse impacts to prairie dogs and their habitat.

Restricting surface disturbing activities would be beneficial to the White Tailed Prairie Dog by reducing vegetation loss and disruption of burrows. Managing livestock grazing to maximize seed production would enhance prairie dog forage and have a beneficial impact on the species. Limitation of travel to designated routes would reduce travel- and OHV-related impacts relative to Alternative A.

As a result of the above management prescriptions, Alternative B would offer an increase in the protection of wildlife values over Alternative A.

4.3.14.2.4.3 Alternative C (0 Acres Proposed for ACEC Designation)

Under Alternative C, the Cisco White-tailed Prairie Dog Complex ACEC would not be designated. This alternative would apply the same management prescriptions as Alternative A, with the following exceptions:

- The area of the ACEC would be open with standard lease terms and/or a controlled surface use stipulation. A 600-foot buffer would be required around known active prairie dog colonies. The total acreage likely to be disturbed by oil and gas development within this ACEC area would be 1,255.4 acres, or 1.1% of the potential ACEC lands (Table 4.91).
- Rights of way could be authorized throughout the area
- Livestock grazing would be managed to maximize seed production of range vegetation using AMPs (this would be done without changing the season of use).
- OHV use would be limited to designated routes.
- Surveys for prairie dogs would be conducted prior to surface-disturbing activities in addition to other avoidance and other mitigating measures. These measures would reduce the adverse impacts to prairie dogs and their habitat

Because of these exceptions, the overall impacts to the relevant and important values in this area would be less adverse than under Alternative A, but also less protective than Alternative B.

4.3.14.2.4.4 Alternative D (0 Acres Proposed for ACEC Designation)

Alternative D would have the same impacts as Alternative C, except that livestock grazing would not be managed to maximize seed production. This would limit the amount of forage available for the white tailed prairie dog, possibly adversely impacting their populations.

About 86,295 acres would be open to oil and gas leasing with standard stipulations, rather than leasing with controlled surface use. This could have an adverse impact on the species, although surveys for prairie dogs would be conducted prior to surface-disturbing activities in addition to other avoidance and other mitigating measures. These measures would reduce the adverse impacts to prairie dogs and their habitat. Limitation of travel to designated routes would reduce travel- and OHV-related impacts relative to Alternative A.

The total acreage likely to be disturbed by oil and gas development within this ACEC area would be 1,256 acres (Table 4.91). As in Alternatives B and C, OHV use would be limited to designated routes. Therefore, Alternative D is far less protective than Alternative B, similar to Alternative C, but slightly more protective than Alternative A, because surface disturbing activities could adversely impact prairie dogs.

4.3.14.2.5 Colorado River Corridor Potential ACEC (50,483 Acres)

If designated, the Colorado River Corridor ACEC would be managed to protect the relevant and important threatened, endangered, and sensitive plants, threatened and endangered fish, wildlife, and scenery values, where designated (under Alternative B).

Of the 50,483 acres proposed for ACEC designation, approximately 7,280 acres are within the Negro Bill WSA and would be managed under IMP. This acreage would be closed to mineral development and all other surface disturbing activities under all alternatives. This would result in beneficial impacts to the relevant and important values of the ACEC.

Under all alternatives, impacts from the existing Three Rivers Withdrawal on a total of 18,519 acres of the ACEC would reduce or eliminate impacts to the relevant and important values on that acreage, regardless of whether the ACEC is designated. The withdrawal precludes the development of locatable minerals.

4.3.14.2.5.1 Impacts Common to All Action Alternatives (B, C and D)

The potential Colorado River Corridor ACEC is located within the Colorado Riverway SRMA: recreation in the ACEC area is to be managed in accordance with the management prescriptions outlined in this SRMA. The area of the Three Rivers Withdrawal is NSO for oil and gas leasing and other surface disturbing activities under all action alternatives

4.3.14.2.5.2 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the Colorado River Corridor ACEC would not be designated. The 43,329 acres[7] of the proposed ACEC that are not within the Negro Bill Canyon WSA would have the following management stipulations:

- A small portion of the river corridor would be managed for recreation activities as part of the Colorado River SRMA. A SRMA is established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC.
- The 43,329 acres of the proposed ACEC outside the WSA would be open to oil and gas leasing. Of these 43,329 acres, 10,864 acres would be managed with timing limitations and controlled surface use stipulations, 1,189 acres would be managed with a NSO stipulation, and 31,276 acres would be open under standard lease terms.
- Woodland harvest would be limited to the area north of the Colorado River.
- There are no visual resource management classes; VRM would be managed according to inventory class.

Based on projections of oil and gas development in the Eastern Paradox RFD area, approximately 35 acres of surface disturbance within the proposed ACEC are likely to occur over the life of the plan (Table 4.92). This surface disturbance would adversely impact the scenic values and fragment wildlife habitat within the area.

[7] Due to acreage discrepancies between the existing RMP and new GIS data, the acreages for the mineral leasing categories do not match the acreage for the potential ACEC.

Table 4.92. Acres of Colorado River Corridor Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Colorado River Corridor	34.8	0	26.1	30.4

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.5.3 Alternative B (50,483 Acres Proposed for ACEC Designation)

Under Alternative B, all 50,483 acres proposed would be designated and managed as an ACEC. Of this acreage, 7,280 acres are within the Negro Bill WSA, and 33,548 acres would be managed for wilderness characteristics. Management prescriptions applicable to the entire area would provide far more protection under this alternative than under Alternative A, due to the following prescriptions:

- No vegetation treatments would be allowed except to treat noxious weeds.
- The area would be managed as VRM Class I.
- OHV and mechanized vehicle use would be limited to designated routes and there would be no competitive OHV events.
- About 40,828 acres would be closed to oil and gas leasing (within the Negro Bill WSA and non-WSA lands wilderness characteristics areas in Dome Plateau, Fisher Towers, Mary Jane Canyon and Negro Bill Canyon). The remaining acreage (9,655 acres) would be managed with a no surface occupancy stipulation for oil and gas leasing and would preclude other surface disturbing activities. Because the entire area is managed as closed or NSO, no oil and gas development is expected under this alternative (Table 4.92), compared to the 35 acres of surface disturbance projected in Alternative A.
- Special Recreation Permit issuance would be adjusted to not interfere with bighorn sheep lambing habitat.
- Vehicular based camping (and associated campfires) would only be allowed in designated sites on the south side of the Colorado River.
- All public lands in the proposed ACEC would be retained in public ownership except for a parcel identified in the Professor Valley land exchange, and acquiring inholdings would be prioritized.
- No woodland harvest would be allowed.

Restricting vehicular camping to the south side of the Colorado River, and timing SRP issuance and livestock grazing seasons of use so as to not interfere with bighorn sheep lambing habitat would have the beneficial effect of reducing human disturbance to ewes and lambs during their most vulnerable periods. This would reduce mortality to newborn lambs.

The on-going Professor Valley land exchange has identified lands for disposal. Should the exchange fall through, the area proposed for exchange would be managed under the proposed ACEC. No other parcels within the ACEC would be considered for disposal. There would be a

beneficial effect to all resources, since the disposed public lands would likely be developed. The same benefit would result from acquiring inholdings within the ACEC.

Alternative B provides the greatest protection for the relevant and important values identified in the Colorado River Corridor Potential ACEC.

4.3.14.2.5.4 Alternative C (0 Acres Proposed for ACEC Designation)

The Colorado River Corridor ACEC would not be designated under Alternative C, which would result in some adverse impacts to the relevant and important values of the area (Although T&E species would be protected by law). Overall impacts would be more adverse than under Alternative B. The area would be managed under the following management actions:

- The recreation management prescriptions in the Colorado Riverway SRMA for the Dry Mesa/Cache Valley area north of the Colorado River would be the same as under Alternative B, except that Alternative C does not restrict river-based camping.
- The VRM designation outside the WSA would be VRM Class II.
- Most of the potential ACEC would be managed as closed or with a NSO stipulation for oil and gas leasing as well as precluding other surface disturbing activities. However, the northwest portion of the potential ACEC would be managed as open with timing limitations and controlled surface use stipulations. As a result, the acreage projected to be disturbed within the area (outside the WSA) would be 26.1 acres (Table 4.92). This represents more disturbance than the 0 acres projected to be disturbed in Alternative B.

Because of the less restrictive VRM class, Alternative C would have slightly less protective effect on scenic resources than would Alternative B. The prescriptions designed to protect desert bighorn would not be as stringent as in Alternative B. There would be less minerals-related surface disturbance than under Alternative A and D, but more than under Alternative B.

Management of the potential ACEC under Alternative C is more beneficial to the relevant and important values than under Alternatives A and D but less than under Alternative B.

4.3.14.2.5.5 Alternative D (0 Acres Proposed for ACEC Designation)

Alternative D would result in nearly the same impacts to relevant and important values as Alternative C, except that it would open the non-WSA, non-withdrawn lands to oil and gas leasing and other surface disturbing activities with timing limitation and controlled surface use stipulations. This would result in more acreage open to oil and gas development than under Alternatives B and C, thereby resulting in greater adverse impacts to relevant and important values. Oil and gas development is projected to disturb 30.4 acres within the potential Colorado River Corridor ACEC.

Therefore, while many impacts to the relevant and important values would be the same as under Alternative C, impacts from oil and gas development would be more adverse than under Alternatives B and C, although less adverse than Alternative A. Protection of T&E plants would occur under Alternative D.

4.3.14.2.6 COTTONWOOD-DIAMOND WATERSHED POTENTIAL ACEC (35,830 ACRES)

If designated, the Cottonwood-Diamond Watershed ACEC would be managed to preserve the relevant and important Cottonwood-Diamond watershed value, (under Alternatives B and C). This area was severely burned in a 2003 wildfire. Since then, the danger of flash floods and mudslides has posed significant hazards to human life and safety.

Under all alternatives, out of the 35,830 acres of the potential ACEC, a total of 34,004 acres are located within the Flume, Coal Canyon, and Spruce WSAs. This would result in beneficial impacts to the watershed within that acreage, as WSAs are closed to oil and gas leasing and other surface disturbing activities.

4.3.14.2.6.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the Cottonwood-Diamond Watershed ACEC would not be designated. Approximately 1,825 acres of the proposed Cottonwood-Diamond Watershed ACEC that are outside of WSAs would be managed with the following management prescriptions:

- The potential ACEC is located within the Book Cliffs RFD area. Oil and gas development would be subject to timing limitation stipulations on 1,825 acres. On this acreage, it is projected that oil and gas development would result in about 1.1 acres of surface disturbance of the potential ACEC lands.
- Rights-of-way could be granted in this area
- There are no visual resource management classes; VRM would be managed under the inventory class.
- Livestock grazing would not be available in the Cottonwood, Diamond or Bogart allotments.
- OHV use is limited to existing roads

4.3.14.2.6.2 Alternatives B and C (35,830 Acres Proposed for ACEC Designation)

Under Alternatives B and C, the entire 35,830 acres proposed would be designated as the Cottonwood Diamond Watershed ACEC until the watershed is restored to a healthy and functioning condition. Management prescriptions in Alternatives B and C would provide additional protection to the watershed (compared to Alternative A) by closing all roads except for administrative access, and withholding Special Recreation Permits for the area. The acreage within the WSA would be managed under IMP. Oil and gas leasing is managed as closed in the WSA. In Alternative B, management of non-WSA lands with wilderness characteristics in Flume Canyon and Spruce Canyon would close an additional 1,690 acres to oil and gas leasing with a NSO stipulation in the remaining 135 acres. (The entire 1,825 acres are NSO in Alternative C.) Because the entire area is managed as either closed or with a NSO stipulation, there would be 0 acres of surface disturbance due to oil and gas development, as compared to 1.1 acres in Alternative A.

Alternative B would also designate the area as part of the Bookcliffs SRMA. A SRMA is established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC. Closing roads and not issuing Special Recreation

Permits would have the effect of reducing human presence in the area, thus reducing human impacts that would slow the rehabilitation of the area.

Under Alternatives B and C, the area would not be available for grazing, as both the Cottonwood and Diamond allotments are not available. This would have beneficial impacts to the watershed by eliminating the erosion caused by livestock. Under Alternatives B and C, managing the area as an ACEC would provide more beneficial impacts to the relevant and important values of watershed protection than under Alternatives A and D.

4.3.14.2.6.3 Alternative D (0 Acres Proposed for ACEC Designation)

Under Alternative D, the area would not be designated as an ACEC. OHV use would be limited to designated routes, which would be a beneficial impact to the relevant and important value of this area. Approximately 1.1 acres would likely be disturbed by oil and gas development. Under Alternative D, the area would be available for grazing, as the Cottonwood and Diamond allotments are available for livestock use. This would cause adverse impacts from the erosion caused by livestock. Adverse impacts, especially from the reinstatement of livestock grazing, to the relevant and important values are more than Alternatives B and C or A.

4.3.14.2.7 Highway 279 Corridor/Shafer Basin/Long Canyon Potential ACEC (13,500 Acres)

If designated, the Highway 279 Corridor/Shafer Basin/Long Canyon ACEC would be managed to preserve the relevant and important special status plant species, wildlife, and cultural and scenic resources values (under Alternatives B and C).

Under all alternatives, impacts from the existing Three Rivers Withdrawal on a total of 2,034 acres of the ACEC would reduce or eliminate impacts to the relevant and important values on that acreage, regardless of whether the ACEC is designated. The withdrawal precludes the development of locatable minerals.

The majority of the potential ACEC is located within the Colorado Riverway SRMA; recreation in the ACEC area is to be managed in accordance with the management prescriptions outlined in this SRMA. SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC. The area of the Three Rivers Withdrawal is NSO for oil and gas leasing and other surface disturbing activities under all action alternatives.

4.3.14.2.7.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the area would not be designated as an ACEC, and would instead be subject to the following management:

- OHV use would be limited to existing routes.
- There are no visual resource management classes. VRM would be managed as inventory class.

- The majority of the potential ACEC would be open to oil and gas leasing under standard lease terms. About 4,606 acres of the potential ACEC would be open subject to special stipulations (controlled surface use or timing limitations). As a result, based on projections of oil and gas development in the Big Flat – Hatch Point, RFD area, approximately 19 acres of surface disturbance within the proposed ACEC are likely to occur over the life of the plan. (Table 4.93).

Table 4.93. Acres of Highway 279/Shafer Basin/Long Canyon Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Highway 279/Shafer Basin/Long Canyon	19.1	0	0.0	18.3

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.7.2 Alternatives B and C (13,500 Acres Proposed for ACEC Designation)

Under Alternatives B and C, the entire 13,500 acres proposed would be designated as an ACEC. In Alternative B only, 3,502 acres of the ACEC would be managed for wilderness characteristics. The following prescriptions would result in beneficial impacts to the ACEC:

- Permitted activities would be confined to main roads within bighorn lambing habitat during lambing season.
- Limit OHV use to designated routes.
- The Wall Street rock art sites would be managed as interpretive sites.
- Vehicle-based camping would be restricted to campgrounds, and campfires would not be allowed outside of campgrounds.
- The area would be designated VRM Class I under Alternative B and as VRM Class II under Alternative C.

The restrictions on permitted activities, vehicle-based camping, and campfires would result in no adverse impacts to the relevant and important values in this ACEC. The adverse impacts from all recreation decisions would be reduced under this alternative as camping would no longer occur.

Under Alternative B, 3,502 acres of non-WSA lands in Dead Horse Cliffs, Goldbar, Gooseneck, and Shafer Canyon that are managed for wilderness characteristics would be closed to oil and gas leasing. On the remaining 9,998 acres, oil and gas leasing would be managed with a NSO stipulation. The entire ACEC would be managed with a NSO stipulation under Alternative C. Because under Alternatives B and C, the entire potential ACEC would be managed as either closed or with a NSO stipulation, no oil and gas development is projected to occur.

Setting up the Wall Street rock art sites as interpretive sites would have a beneficial effect by educating and enhancing the public's enjoyment of the resource. Although such development brings more human traffic to the sites, the higher level of management can reduce purposeful or inadvertent human-caused damage.

Although Alternative C would be VRM Class II rather than Class I, there would be negligible impacts to any resources due to VRM Class II management because of the no-surface occupancy stipulation.

Under Alternatives B and C, managing the areas as an ACEC would provide more beneficial impacts to the relevant and important values than under Alternatives A and D.

4.3.14.2.7.3 Alternative D (0 Acres Proposed for ACEC Designation)

This area would not be designated as an ACEC under Alternative D. Management prescriptions under this alternative would generally be the same as under Alternative A, with a few exceptions. Under Alternative D, limiting travel to designated routes would benefit the relevant and important values by protecting these values from the damage caused by cross-country travel. Therefore, Alternative D would have slightly less adverse impacts to the potential values of the ACEC than Alternative A, but greater adverse impacts than Alternatives B and C.

4.3.14.2.8 Labyrinth Canyon Potential ACEC (8,528 Acres)

If designated, the Labyrinth Canyon ACEC would be managed to preserve the relevant and important special status fish species and scenic resource values (under Alternative B).

Under all alternatives, impacts from the existing Three Rivers Withdrawal on the potential ACEC would reduce or eliminate impacts to the relevant and important values on that acreage, regardless of whether the ACEC is designated. The withdrawal precludes the development of locatable minerals.

4.3.14.2.8.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the area would not be designated as an ACEC. It would be managed with the following stipulations:

- OHV use would be limited to existing roads.
- There would be no visual resource management classes; VRM would be managed as inventory class.
- The majority of the area is open to oil and gas leasing under standard lease terms. Based on projections of oil and gas development in the Big Flat – Hatch Point, RFD area, approximately 12 acres of surface disturbance within the proposed ACEC (0.1% of the potential ACEC lands) are likely to occur over the life of the plan. (Table 4.94).

Table 4.94. Acres of Labyrinth Canyon Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Labyrinth Canyon	12.1	0	10.1	11.5

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.8.2 Alternative B (8,528 Acres Proposed for ACEC Designation)

Under Alternative B, 8,528 acres would be designated as an ACEC. Of the 8,528 acres, 5,492 acres would be managed for wilderness characteristics. Management prescriptions would provide more protection of the relevant and important values under this alternative than under Alternative A, due to the following prescriptions:

- OHV use would be limited to designated routes.
- No new roads or trails for mechanized or motorized use would be authorized.
- About 5,943 acres of non-WSA lands in Labyrinth Canyon and Horsethief Point managed for wilderness characteristics and would be closed to oil and gas leasing. The remaining 3,036 acres would be managed with a NSO stipulation for oil and gas leasing as well as precluding other surface disturbing activities, including ROWs. Because the entire area is either closed or NSO, no oil and gas development is projected to occur under this alternative (Table 4.94), compared to the 12 acres projected in Alternative A.
- Manage as VRM Class I

Not allowing any new road construction would prevent the resultant erosion and sediment/salt travel to the Green River. This could have a beneficial effect on threatened and endangered fish by reducing negative impacts to water quality. The same effect would be achieved by the closed and NSO stipulation for oil and gas leasing and other surface disturbing activities.

Changing the VRM Class from no management (under Alternative A) to VRM I (under this alternative) would preclude most surface disturbing activities. This would have a protective effect for threatened and endangered fish by preventing erosion that could negatively affect water quality in the Colorado River system.

As a result of the above management prescriptions, Alternative B would offer an increase in the protection of scenic and threatened and endangered fish values over Alternative A.

4.3.14.2.8.3 Alternatives C and D (0 Acres Proposed for ACEC Designation)

This area would not be designated as an ACEC under Alternatives C and D. The area's management prescriptions would generally be the same as under Alternative A, with a few exceptions. Under Alternatives C and D, OHV use would be limited to designated routes, and the area would be designated as VRM Class II. Route designation would beneficially impact the relevant and important values by preventing the visual scarring of multiple travel routes, and the more stringent VRM class would slightly reduce adverse, surface-disturbance impacts Therefore, Alternatives C and D would have similar impacts as Alternative A, with the exceptions stated above. Approximately 10-11 acres are likely to be disturbed by oil and gas development under these two alternatives. Thus, Alternatives C and D are not as protective of the relevant and important values as is Alternative B, but they are more protective than Alternative A.

4.3.14.2.9 Mill Creek Canyon Potential ACEC (13,501 Acres)

If designated, the Mill Creek Canyon ACEC would be managed to protect the relevant and important cultural resources, fish and wildlife habitat, riparian/watershed and scenery values (under Alternatives B and C).

Under Alternatives B and C, the potential Mill Creek Canyon ACEC is located within the South Moab SRMA. SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC.

Approximately 9,780 acres of the potential ACEC (13,501 acres) are located within the Mill Creek Canyon WSA. This would result in beneficial impacts to the relevant and important values within that acreage because management under IMP would preclude surface disturbing activities.

4.3.14.2.9.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the Mill Creek Canyon ACEC would not be designated. The 9,780 acres within the WSA would continue to be managed under IMP. The 3,721-acre area proposed for designation that is outside the Mill Creek Canyon WSA would be subject to the following management:

- Vehicles are limited to existing/designated routes.
- There are no visual resource management classes; VRM would be managed under the inventory class.
- The area would be managed as open to oil and gas leasing under standard lease terms. Based on projections of oil and gas development in the Eastern Paradox RFD area, approximately 3 acres of surface disturbance (0.1% of the potential ACEC lands outside the WSA) are likely to occur over the life of the plan. (Table 4.95).

Table 4.95. Acres of Mill Creek Canyon Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Mill Creek Canyon	2.8	0	0.0	2.7

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

Despite the restrictions on surface-disturbing activities in riparian areas, the surface-disturbing activities allowed under Alternative A may result in erosion and water quality impacts. Although limiting camping to designated areas would help reduce human disturbances, the continued use of hiking and OHV routes for recreation would result in adverse impacts to the relevant and important values. Therefore, the overall impacts of this alternative to the area's relevant and important values would result in more adverse impacts than Alternatives B and C, and similar to Alternative D.

4.3.14.2.9.2 Alternative B (13,501 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 13,501 acres proposed, including the WSA acreage (9,780 acres) would be designated as an ACEC, with these specific prescriptions:

- Only day-use recreation facilities could be developed.
- Closed to vehicle-based camping, recreational mining, and woodland harvest.[8]
- Prioritized for Class III cultural inventories to protect Native American traditional cultural areas.
- Maintenance of a 3 cfs flow in the South Fork of Mill Creek below the Sheley diversion.
- Designate as VRM Class I.
- Manage 2,335 acres of Mill Creek Canyon non-WSA lands with wilderness characteristics as closed to oil and gas leasing and other surface disturbing activities.
- The portion of the ACEC that is within the Mill Creek WSA would be managed under IMP.
- The area would be unavailable for grazing.

This alternative would offer the greatest protection to cultural resources, scenery, and natural systems. Alternative B offers the greatest protection of all alternatives for the relevant and important values in the potential Mill Creek Canyon ACEC.

4.3.14.2.9.3 Alternative C (3,721 Acres Proposed for ACEC Designation)

Under Alternative C, only the 3,721 acres outside the Mill Creek Canyon WSA would be designated as an ACEC. Impacts under Alternative C would be essentially the same as under Alternative B, except that there would be slightly greater potential for surface disturbance (including ROWs) due to the designation as VRM Class II under Alternative C. Therefore, Alternative C is more protective of relevant and important values than are Alternatives A and D, but slightly less protective than is Alternative B.

4.3.14.2.9.4 Alternative D (0 Acres Proposed for ACEC Designation)

Alternative D has impacts similar to Alternative A, and is more adverse than Alternative B and C. However, it would result in slightly fewer adverse impacts than Alternative A, due to the following decisions under Alternative D:

- All vehicles would be limited to designated routes.
- Designate as VRM Class II.
- The area would be unavailable for grazing.

[8] Exceptions would be made for backpacking fires in the uplands; however, no campfires would be allowed in riparian areas.

4.3.14.2.10 Ten Mile Wash Potential ACEC (4,980 Acres)

If designated, the Ten Mile Wash ACEC would be managed to preserve the relevant and important values of cultural resources, riparian/watershed and wildlife values under Alternatives B and C.

4.3.14.2.10.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the potential Ten Mile Wash ACEC area would not be designated as an ACEC. The areas would be subject to the following management:

- OHV use would be limited to existing routes
- Woodland harvest would be allowed.
- There would be no visual resource management classes; VRM would be managed as inventory class.
- Oil and gas leasing would be open under standard lease terms. Based on projections of oil and gas development in the Big Flat – Hatch Point RFD area, approximately 7 acres of surface disturbance within the potential ACEC are likely to occur over the life of the plan. (Table 4.96).

Table 4.96. Acres of Ten Mile Wash Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Ten Mile Wash	7.0	0	0.0	6.7

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.10.2 Alternative B (4,980 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 4,980 acres would be designated as an ACEC, with the following prescriptions:

- Woodland harvest, livestock grazing, and vehicular travel would not be allowed.
- Voluntary relinquishment of grazing privileges allowed.
- Apply a NSO stipulation for oil and gas leasing and other surface disturbing activities. Close 232 acres of non-WC lands with wilderness characteristics in Labyrinth Canyon to oil and gas leasing.
- Campfires and camping limited to Dripping Springs.
- Designate as VRM Class II.
- The area would be an avoidance area for ROWs.
- Prioritize for Class III cultural inventories, riparian restoration, and scientific research.

Restricting livestock grazing would have beneficial effects to riparian areas due to reduced trampling. Because the route in the wash is within the riparian area, closing the area to vehicular traffic would protect riparian areas and wildlife habitat, as well as making the area less accessible to human activity, reducing the safety hazard from flash flooding.

A no surface occupancy leasing stipulation would preclude oil and gas development and other surface disturbing activities. This action would protect natural resource values. Therefore, Alternative B is more protective of relevant and important values than are Alternative A and D. It is slightly more protective than is Alternative C.

4.3.14.2.10.3 Alternative C (4,980 Acres Designated as ACEC)

Alternative C would designate the Ten Mile Wash area as an ACEC. Alternative C proposes the same management prescriptions as Alternative B except that vehicular travel would be allowed on the designated route within the wash. Adverse effects from this travel could include vandalism and looting of cultural sites. Travel within the bottom the wash could also increase the risk to human safety from flash flooding. The presence of the road could result in loss of riparian vegetation and increased erosion, thereby adversely impacting riparian/watershed resource values. Therefore, Alternative C would be slightly less protective than Alternative B of the relevant and important values.

4.3.14.2.10.4 Alternative D (0 Acres Designated as ACEC)

Under Alternative D, the area would not be designated as an ACEC, and would there therefore be subject to more adverse effects than under Alternatives B and C. Alternative D would result in slightly less adverse impacts than Alternative A, due to the following management:

- Motorized travel would be limited to designated routes.
- No campfires would be allowed outside of designated sites.
- The area would be managed for oil and gas leasing with a timing limitation on 2,558 acres. The remaining 2,422 acres are open under standard lease terms. Oil and gas development would likely disturb 6.7 acres, or ~0.1% of the potential ACEC lands (see Table 4.96).
- The area would be available for ROWs.

4.3.14.2.11 Upper Courthouse Potential ACEC (11,529 Acres)

If designated, the Upper Courthouse ACEC would be managed to preserve the relevant and important cultural resources, paleontological resources, and relict and special status plant species values, where designated (under Alternative B).

The potential Upper Courthouse ACEC is within the Labyrinth Rims/Gemini Bridges SRMA under Alternatives B and C. SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC.

Under all alternatives, harvesting of woodland products would be prohibited. This management decision would eliminate potential adverse impacts from woodland harvest by eliminating the cross country travel that occurs in association with woodcutting.

4.3.14.2.11.1 Alternatives A (0 Acres Proposed for ACEC Designation)

Under Alternatives A, this area would not be designated as an ACEC, and would be subject to the following management:

- Vehicle use would be managed as limited to existing routes.
- There would be no visual resource management classes in Alternative A.
- Oil and gas leasing would be managed as open under standard lease terms. Based on projections of oil and gas development in the Big Flat – Hatch Point RFD area, approximately 16 acres of surface disturbance (0.1% of the potential ACEC lands) within the potential ACEC are likely to occur over the life of the plan (Table 4.97).

Table 4.97. Acres of Upper Courthouse Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Upper Courthouse	16.3	0	11.9	15.6

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.11.2 Alternative B (11,529 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 11,529 acres proposed would be designated as an ACEC. This alternative would be more beneficial than any other alternative due to the following protective prescriptions:

- OHV use would be limited to designated routes.
- Restriction of vehicle-based camping to campgrounds and prohibiting campfires outside of campgrounds.
- Closing the area to vegetation treatments except to treat noxious weeds and exotics or to restore riparian areas.
- Apply a NSO stipulation for oil and gas leasing as well as precluding other surface disturbing activities. The area would be an avoidance area for ROWs.
- Prohibiting new range improvements.
- Prohibition of petrified wood collection.
- Protection of archaeological sites from livestock grazing.
- Prioritization of Class III cultural resources inventories.

Precluding surface disturbing activities would protect relevant and important values because cultural and paleontological resources and relict plants would not be subject to inadvertent

disturbance. Treatment of noxious weeds and exotics could benefit native vegetation, including relict vegetation. Alternative B would be the most protective of all alternatives of relevant and important values.

4.3.14.2.11.3 Alternative C (0 Acres Proposed for ACEC Designation)

Under Alternative C, the area would not be designated as an ACEC. Alternative C would be less protective than Alternative B, but would be slightly more protective than Alternatives A and D (largely because special stipulations are provided for relict plant communities), due to the following management:

- In order to protect relict plant communities, mesa-top areas would be subject to a NSO stipulation for oil and gas leasing and other surface disturbing activities.
- The remainder of the area (outside of the mesa-tops) would be subject to NSO and timing limitation stipulations. The total acreage likely to be disturbed by oil and gas development would be 11.0 acres, or 0.1% of the potential ACEC lands (see Table 4.97).
- Motorized travel would be limited to designated routes.
- The area would be designated as VRM Classes II, III and IV.
- Alternative C is more protective of relevant and important values than Alternatives A and D, but less protective than Alternative B.

4.3.14.2.11.4 Alternative D (0 Acres Proposed for ACEC Designation)

Under Alternatives D, this area would not be designated as an ACEC, and would be subject to the following management:

- Vehicle use would be managed as limited to designated routes.
- Designate as VRM Class III.
- Oil and gas leasing would be managed as open under standard lease terms. Based on projections of oil and gas development in the Big Flat – Hatch Point RFD area, approximately 16 acres of surface disturbance (0.1% of the potential ACEC lands) within the potential ACEC are likely to occur over the life of the plan (Table 4.97). This would be more acres of surface disturbance than under Alternatives B or C.

4.3.14.2.12 Westwater Canyon Potential ACEC (5,069 Acres)

If designated, the Westwater Canyon ACEC would be managed to preserve the relevant and important special status fish species and scenery values where designated (under Alternative B).

The area proposed for designation as the Westwater ACEC is entirely within the Westwater WSA. As such, it is managed under IMP in its entirety and closed to oil and gas leasing and other surface disturbing activities. Woodland harvest is also precluded. As long as the area remains a WSA, these resources management prescriptions would result in no impacts to the relevant and important values.

If the ACEC is designated, impacts from the acquisition and management of inholdings within that designated ACEC would be beneficial to the relevant and important values as surface disturbing activities could be prevented on these parcels. The continuation of the existing withdrawal from locatable minerals development would continue to reduce impacts to the relevant and important values.

4.3.14.2.12.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternative A, the potential Westwater ACEC area would not be designated as an ACEC, and the area would continue to be managed under IMP. However vehicle use on existing routes could result in adverse impacts to scenery as routes proliferate.

4.3.14.2.12.2 Alternative B (5,069 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 5,069 acres proposed would be designated as an ACEC. In addition to the protections that WSA status confers upon this area and their attendant beneficial impacts for the relevant and important values (see above), all motorized travel would be limited to designated routes, and inholdings would be acquired.

Designation of routes would reduce miles of routes in the area and could therefore result in a slight decrease in erosion of sediments that could be carried to the Colorado River. This alternative would result in the greatest beneficial impacts to relevant and important values.

4.3.14.2.12.3 Alternatives C and D (0 Acres Proposed for ACEC Designation).

Under Alternatives C and D, the area proposed as the Westwater ACEC would not be designated. Impacts would be the same as under Alternative A because it is a WSA under all alternatives, except that travel would be limited to designated routes rather than the more loosely defined existing route categorization. Alternatives A, C and D are slightly less protective of relevant and important values than Alternative B.

4.3.14.2.13 White Wash Potential ACEC (2,988 Acres)

If designated, the White Wash ACEC would be managed to preserve the relevant and important riparian dune systems value, where designated (under Alternative B).

Under all action alternatives, the potential White Wash ACEC is within a SRMA. SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC.

4.3.14.2.13.1 Alternative A (0 Acres Proposed for ACEC Designation)

The potential White Wash ACEC would not be designated. It would be managed with the following stipulations:

- The area would be open to cross country OHV travel and to woodland harvest.

- Competitive motorized events would be allowed.
- There would be no visual resource management classes; VRM is managed as inventory class.
- The area would be subject to a NSO stipulation and open under standard lease terms for oil and gas leasing. Based on projections of oil and gas development in the Salt Wash RFD area, approximately 10.5 acres of surface disturbance (0.3% of the potential ACEC lands) are likely to occur over the life of the plan. (Table 4.98).

Table 4.98. Acres of White Wash Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
White Wash	10.1	0	9.4	10.2

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.13.2 Alternative B (2,988 Acres Proposed for ACEC Designation)

Under Alternative B, all 2,988 acres would be designated as the White Wash ACEC Management under Alternative B would be more protective than under Alternative A, primarily due to the prohibition of cross country OHV use and surface disturbing activities, due to the following prescriptions:

- The area would be managed with a NSO stipulation for oil and gas leasing as well as precluding other surface disturbing activities. The area would be an avoidance area for ROWs. No surface disturbance due to oil and gas development is likely to occur (Table 4.98).
- Motorized travel would be limited to designated routes.
- Vehicle-based camping would be allowed in campgrounds only.
- No wood gathering or campfires would be allowed.
- The area would be managed for primitive, non-motorized recreation as part of the Labyrinth/Gemini SRMA.

4.3.14.2.13.3 Alternative C (0 Acres Proposed for ACEC Designation)

Under Alternative C, the area would not be designated as an ACEC. Management of the area would be similar to Alternative A, with the following exceptions:

- The area would be designated as VRM Class III.
- About 1,866 acres would be open to cross country OHV travel. The remaining 1,122 acres would be limited to designated routes.
- Harvesting of woodland products would not be allowed.
- Oil and gas leasing would be managed as open under standard lease terms. Oil and gas development would likely disturb 9.4 acres, or 0.3% of potential ACEC lands (Table 4.98).

This alternative would be more protective of the relevant and important values than Alternatives A and D, primarily because a portion of the area would be limited to designated routes, rather than be open to cross country motorized travel. About 1,866 acres would be open to OHV use under this alternative, making this alternative less protective than Alternative B. Alternatives A, C and D are less restrictive to oil and gas development than Alternative B.

4.3.14.2.13.4 Alternative D (0 Acres Proposed for ACEC Designation)

Under Alternative D, the area would not be designated as an ACEC. Management prescriptions would be similar to Alternative A, except:

- The area would be designated as VRM Class III.
- The entire area would be managed for open OHV use as part of the Dee Pass SRMA.

As a result, Alternative D would have more adverse impacts to relevant and important values than Alternative B because cross country OHV travel and surface disturbing activities could alter the riparian dune system. Alternative D would have similar adverse impacts to relevant and important values as Alternatives A and C, with surface disturbing activities, including open OHV travel, potentially altering the riparian dune system.

4.3.14.2.14 Wilson Arch Potential ACEC (3,700 Acres)

If designated, the Wilson Arch ACEC would be managed to preserve the relevant and important value of scenery where designated (under Alternative B). Under all alternatives, the potential Wilson Arch ACEC is within the Cameo Cliffs SRMA. SRMAs are established to provide for intensive management of recreation activities, potentially benefiting the resource values of concern in the ACEC. Under all alternatives, travel is limited to designated routes.

4.3.14.2.14.1 Alternative A (0 Acres Proposed for ACEC Designation)

Under Alternatives A and D, the area would not be designated as an ACEC. The following management prescriptions would apply:

- There would be no VRM management for Alternative A; the area would be managed under the VRM inventory.
- Under Alternative A, the area is open to oil and gas leasing with standard lease terms Based on projections of oil and gas development in the Lisbon Valley and Big Flat – Hatch Point RFD areas, approximately 26 acres of surface disturbance (0.7% of the potential ACEC lands) are likely to occur over the life of the plan (Table 4.99). This would be more acres of surface disturbance than under Alternative B and approximately equal to Alternative C.

Impacts would be very similar under these two alternatives, with slightly less adverse impacts under Alternative D because of a more restrictive VRM Class. Due to the potential impacts from oil and gas development, impacts to the relevant and important value of scenery would be similar under Alternatives A, C and D and greater than under Alternative B.

Table 4.99. Acres of Wilson Arch Potential ACEC Likely to be Impacted by Oil and Gas Development*, by Alternative

ACEC	Alternative A	Alternative B	Alternative C	Alternative D
Wilson Arch	25.9	0	25.6	25.7

*Based on leasing stipulations and number of wells in the RFD scenario (pro-rated by the area of ACEC designated in each RFD area)

4.3.14.2.14.2 Alternative B (3,700 Acres Proposed for ACEC Designation)

Under Alternative B, the entire 3,700 acres proposed would be designated an ACEC, with the following prescriptions:

- Both mechanical and motorized traffic would be limited to designated routes, and one hiking trail would be built up to Wilson Arch.
- The area would be designated as VRM Class I.
- Oil and gas leasing would be managed with a NSO stipulation, it would be an avoidance area for ROWs, and the area would be closed to woodland harvest. Alternative B would offer the highest level of protection of scenic resources of all the alternatives.

4.3.14.2.14.3 Alternative C (0 Acres Proposed for ACEC Designation)

Alternative C would differ from Alternative A in that the area would be managed with timing limitations and controlled surface use stipulations for oil and gas leasing and other surface disturbing activities. The area would be designated as VRM Class II. Therefore, this alternative would provide a higher level of scenic resource protection than Alternatives A and D, but less than Alternative B. Approximately 25.6 acres are projected to be disturbed by oil and gas development in the potential ACEC during the life of the plan, which is similar to Alternatives A and D, but more than Alternative B. This surface disturbing activity would adversely impact the scenic values of the ACEC.

4.3.14.2.14.4 Alternative D (0 Acres Proposed for ACEC Designation)

Under Alternative D, the area would not be designated as an ACEC. The following management prescriptions would apply:

- The area would be managed as VRM Class III.
- The area is open to oil and gas leasing with timing limitations. Based on projections of oil and gas development in the Lisbon Valley and Big Flat – Hatch Point RFD areas, approximately 26 acres of surface disturbance (0.7% of the potential ACEC lands) are likely to occur over the life of the plan (Table 4.99).

4.3.14.3 National Historic Trail – Old Spanish Trail

In all alternatives, the Old Spanish Trail would be managed to enhance historic interpretation and public enjoyment and understanding of the Old Spanish National Historic Trail consistent with

the Old Spanish Trail Comprehensive Management Plan. This would minimize adverse impacts to the historic integrity of the trail.

4.3.14.4 Wild and Scenic Rivers (WSRs)

4.3.14.4.1 Impacts Common to All Action Alternatives (B, C and D)

In all action alternatives (B, C, and D), where eligible rivers are determined suitable, the BLM would manage these segments to protect or enhance the outstandingly remarkable values, tentative classification, and free-flowing nature of these rivers with specific protection allocations within the river corridor (1/4 mile of the high water mark on each side of the river). BLM management is limited to public lands, and is subject to valid existing rights.

The free-flowing character of eligible river segments would be protected to the extent that modifications such as stream impoundments, channelization, and/or riprapping would not be permitted along BLM shorelines. However, depending upon the alternative, values may be at risk from potential mineral development, OHV activity, or other surface disturbing activities. Also, the protection is limited because there are no Federal reserved water rights established for in-stream flow purposes due to eligibility or suitability determinations. In addition, unless BLM land is involved in a proposed action, BLM has no control of potential modifications of the shoreline or other development (including development related to the perfection of water rights) on non-public lands. Because of these factors, there would be no effect on the Colorado River Compact from protective management of eligible/suitable segments. BLM's management authority only extends to public lands within the river corridor, and there are no water rights associated with suitability determinations. A suitability determination also has no effect on existing water compacts.

Table 4.100 outlines the segments of rivers that would be determined suitable by alternative.

Table 4.100. River Segments that would be Determined Suitable and Total River Miles by Alternative

River/River Segment	Alternative A (River Miles)[1]	Alternative B (River Miles)	Alternative C (River Miles)	Alternative D (River Miles)
Beaver Creek				
Segment # 1	0.0	6.7	0.0	0.0
Segment # 2	0.0	1.0	0.0	0.0
Colorado River				
Segment # 1	1.2	1.2	0.0	0.0
Segment # 2	14.4	14.4	14.4	0.0
Segment # 3	11.2	11.2	0.0	0.0
Segment # 3(a)	0.0	0.0	9.3	0.0
Segment # 3(b)	0.0	0.0	1.9	0.0
Segment # 4	0.0	33.1	33.1	0.0
Segment # 5	0.0	5.7	5.7	0.0

Table 4.100. River Segments that would be Determined Suitable and Total River Miles by Alternative

River/River Segment	Alternative A (River Miles)[1]	Alternative B (River Miles)	Alternative C (River Miles)	Alternative D (River Miles)
Segment # 6	0.0	3.7	3.7	0.0
Cottonwood Canyon	0.0	10.4	0.0	0.0
Dolores River				
Segment # 1	5.9	5.9	5.9	0.0
Segment # 2	6.3	6.3	6.3	0.0
Segment # 3	9.9	9.9	9.9	0.0
Green River				
Segment # 1	0.0	7.7	0	0.0
Segment # 1(a)	0.0	0.0	15.8	0.0
Segment # 2	0.0	8.1	0.0	0.0
Segment # 3	0.0	1.5	0.0	0.0
Segment # 3(a)	0.0	0.0	0.0	0.0
Segment # 4	0.0	12.9	0.0	0.0
Segment # 4(a)	0.0	0.0	49	0.0
Segment # 5	0.0	15.8	0.0	0.0
Segment # 6	0.0	29.3	0.0	0.0
Mill Creek				
Segment # 1	0.0	1.4	0.0	0.0
Segment # 2	0.0	4.6	0.0	0.0
Negro Bill Canyon				
Segment # 1	0.0	7.2	0.0	0.0
Segment # 2	0.0	0.2	0.0	0.0
North Fork Mill Creek	0.0	11.2	0.0	0.0
Onion Creek				
Segment # 1	0.0	2.8	0.0	0.0
Segment # 2	0.0	9.7	0.0	0.0
Professor Creek	0.0	7.3	0.0	0.0
Rattlesnake Canyon	0.0	31.6	0.0	0.0
Salt Wash	0.0	0.3	0.0	0.0
Thompson Canyon	0.0	5.5	0.0	0.0
Totals	**0.0**	**266.6**	**155.0**	**0.0**

[1]All river segments are eligible under Alternative A; those listed are considered suitable under Alternative A.

Valid Existing Rights and WSRs

Six of rivers listed above have acreage that is leased for oil and gas under stipulations developed in earlier RMPs. These oil and gas leases would remain valid until they expire (leases are issued

for ten years). While all leases do not proceed to development, stipulations developed in this RMP for oil and gas leasing would not apply to leases issued under previous RMPs. Table 4.101 predicts the number of wells that could be drilled under valid existing leases, by river.

Table 4.101. WSRs, Number of Wells Predicted, and Currently Leased Acreage

River	Total Acreage	Acreage under Existing Leases	Percentage of WSR under Lease	RFD Area	Number of Wells Predicted under Existing Leases
Beaver Creek	2,268	39	1.7	Eastern Paradox	<1
Colorado River	23,623	3,786	1.6	Eastern Paradox/Big Flat	<1
Cottonwood Canyon	2,938	907	30.0	Bookcliffs	<1
Dolores River	6,823	1,584	23.0	Eastern Paradox	<1
Green River	13,734	415	3.0	Big Flat	<1
Mill Creek	1,864	153	8.0	Eastern Paradox	<1

Fewer than one well is predicted because of current valid oil and gas leases on any river proposed for Wild and Scenic status. This would not adversely impact the outstandingly remarkable values of the WSR in question.

4.3.14.4.2 ALTERNATIVE A

Under Alternative A, portions of the Colorado and Dolores Rivers were found suitable as part of the Wild and Scenic River Study Final EIS (NPS 1979). For the remaining river segments, a suitability determination would not be made, but the other river segments that were determined eligible in the *Wild and Scenic Rivers Review Eligibility Determination* for the MFO would remain eligible under this alternative (BLM 2004g). Where BLM manages the shoreline or other lands within the river corridors, they would be managed to maintain the free-flowing nature, outstandingly remarkable values, and tentative classification. Because the eligible river corridors would be subject to the existing land use plan as far as resource allocations are concerned, they may be subject to case-by-case actions. These would be addressed through the NEPA process with mitigation applied if appropriate. If any proposed actions would affect the eligibility of the river segment, it is BLM policy to deny the action until suitability can be considered.

All river segments not closed to oil and gas leasing due to WSA designation or management for other resources would be subject to leasing under standard lease terms or timing limitations and controlled surface use stipulation. This could result in surface disturbance to these river corridors. These segments include Beaver Creek, segments of the Colorado River below the Dolores River confluence, the Green River, Mill Creek, Onion Creek, Professor Creek and Thompson Canyon.

All segments except for those in the Three Rivers withdrawal (the Green, Colorado, and Dolores Rivers) would be open to mining claims for locatable minerals. Generally, impacts to riparian corridors would be avoided under standard lease terms and BLM riparian policy. Therefore, regardless of the leasing category, these areas would be protected from development. However there is an exception to allow for development in riparian areas if there are no other practical alternatives. In areas where the 1/4 mile WSR corridor extends beyond the riparian corridor, surface disturbing activities may occur such as oil and gas or salable mineral development. These types of activities could adversely impact the outstandingly remarkable values of these rivers. Adverse impacts would include loss of vegetation, habitat fragmentation, and loss of scenic values.

Under Alternative A, portions of the Colorado River (parts of segments #2, #3, and #4) would be managed as the Colorado River SRMA. This management would enhance this segment's recreational values by providing boating opportunities, and would not affect the other outstandingly remarkable values. It would not affect the free-flowing nature of the river, and would be in keeping with the tentative classifications of scenic, recreational and wild.

Beaver Creek (Segment #2), the Colorado River (segments #2, #3(a), #3(b), and #4), Cottonwood Canyon, the Dolores River (Segments #1, #2, and #3), the Green River (Segments #3, #4(a), and #4(b)), Mill Creek (Segments #1 and #2), the North Fork Mill Creek, Onion Creek (Segments #1 and #2), Professor Creek, Rattlesnake Canyon, and Thompson Canyon would be open to cross-country OHV use, in part. Temporary impacts to their outstanding and remarkable values could occur from vehicular surface disturbance and noise. All the remaining eligible river segments would be in a limited or closed OHV category thereby protecting them from disturbance related to OHV activity.

4.3.14.4.3 ALTERNATIVE B

Under Alternative B, 266.6 river miles involving the Beaver Creek (Segments #1 and #2), Colorado River (Segments #1–6), Cottonwood Canyon, Dolores River (Segments #1-3), Green River (Segments #1–6), Mill Creek (Segments #1 and #2), Negro Bill Canyon (Segments #1 and #2), North Fork Mill Creek, Onion Creek (Segments #1 and #2), Professor Creek, Rattlesnake Canyon, Salt Wash, and Thompson Canyon river segments would be recommended as suitable for designation into the National Wild and Scenic River System (see Table 4.102). Overall, because of the increased acreage identified and managed as suitable, and because other resource allocations would be consistent with management of the rivers' suitability, this alternative would provide greater protection to outstanding remarkable values than does Alternative A.

All of the segments recommended as suitable would be managed as closed or with a NSO stipulation for oil and gas leasing as well as precluding other surface disturbing activities, including ROWs. All segments except for those in the Three Rivers Withdrawal (the Green, Colorado, and Dolores Rivers) would be open to mining claims for locatable minerals. Since the entire area is either closed or NSO, the risks to the outstanding and remarkable values are negligible.

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
Beaver Creek Segment #1	RM: 6.7 Acres: 2,061	Suitability not considered. Oil and gas leasing: open with standard stipulations.	Recommendation: Suitable-Wild. Within the Dolores River Canyon SRMA. All 6.7 miles managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: Closed.	Recommendation: Not Suitable. Within the Dolores River Canyon SRMA. All 6.7 miles managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Oil and gas leasing: NSO.
Beaver Creek Segment #2	RM: 1.0 Acres: 207	Suitability not considered. Oil and gas leasing: open with standard stipulations.	Recommendation: Suitable-Scenic. Within the Dolores River Canyon SRMA. All managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: Closed.	Recommendation: Not Suitable. Within the Dolores River Canyon SRMA. All managed to preserve non-WSA lands with wilderness characteristics (Beaver Creek WIA). Oil and gas leasing: NSO.	Recommendation: Not Suitable. Oil and gas leasing: open with special stipulations.
Colorado River Segment #1	RM: 1.2 Acres: 525	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: NSO.	Recommendation: Suitable-Scenic. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: open with special stipulations.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: open with special stipulations.
Colorado River Segment #2	RM: 14.4[a] Acres: 4,531	Suitability not considered. Overlaps the Westwater WSA. Within the Colorado River SRMA. Withdrawn from mineral entry. Oil and gas leasing: NSO.	Recommendation: Suitable-Wild. Overlaps the Westwater WSA. Overlaps the Two Rivers SRMA. Overlaps the Westwater Canyon ACEC. Withdrawn from mineral entry.	Recommendation: Suitable-Wild. Overlaps the Westwater WSA. Overlaps the Two Rivers SRMA. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps the Westwater WSA. Overlaps the Two Rivers SRMA. Withdrawn from mineral entry (Three Rivers Withdrawal). Open with special stipulations.

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
			Oil and gas leasing: closed.		Oil and gas leasing: closed.
Colorado River Segment #3	RM: 11.2 Acres: 4,200	Suitability not considered. Within the Colorado River SRMA. Withdrawn from mineral entry. Oil and gas leasing: NSO.	Recommendation: Suitable-Scenic. Overlaps the Two Rivers SRMA. Withdrawn from mineral entry. Oil and gas leasing: NSO.	N/A	Recommendation: Not Suitable. Overlaps the Two Rivers SRMA. Withdrawn from mineral entry. Oil and gas leasing: NSO.
Colorado River Segment #3(a)	RM: 9.3 Acres: 3,535	Not proposed under this Alternative.	Not proposed under this Alternative.	Recommendation: Suitable-Scenic. Overlaps the Two Rivers SRMA. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Not proposed under this Alternative.
Colorado River Segment #3(b)	RM: 1.9 Acres: 665	Not proposed under this Alternative.	Not proposed under this Alternative.	Recommendation: Suitable-Recreational. Overlaps the Two Rivers SRMA. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Not proposed under this Alternative.
Colorado River Segment #4*	RM: 33.1[b] Acres: 12,151	Suitability not considered. Partially within the Colorado Riverway SRMA. Withdrawn from mineral entry. Oil and gas leasing: open with special stipulations.	Recommendation: Suitable-Recreational. Within the Colorado Riverway SRMA. Withdrawn from mineral entry (Three Rivers Withdrawal). Partially within the Colorado River Corridor ACEC. Oil and gas leasing: NSO.	Recommendation: Suitable-Recreational. Within the Colorado Riverway SRMA. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Partially within the Colorado Riverway SRMA. Oil and gas leasing: NSO.

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
Colorado River Segment #5	RM: 5.7 Acres: 1,275	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: open with special stipulations.	Recommendation: Suitable-Scenic. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Suitable-Recreational. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.
Colorado River Segment #6	RM: 3.7 Acres: 941	Suitability not considered. Oil and gas leasing: open with special stipulations.	Recommendation: Suitable-Wild. Overlaps the Hwy 279 Corridor/ Shafer Basin/Long Canyon ACEC. Within the Colorado Riverway SRMA. Oil and gas leasing: NSO.	Recommendation: Suitable-Scenic. Overlaps the Hwy 279 Corridor/ Shafer Basin/Long Canyon ACEC. Within the Colorado Riverway SRMA. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Within the Colorado Riverway SRMA. Oil and gas leasing: Open with standard stipulations.
Cottonwood Canyon	RM: 10.4 Acres: 2,938	Suitability not considered. Canyon bottom is the border between the Spruce Canyon and Coal Canyon WSAs. Oil and gas leasing: Closed.	Recommendation: Suitable-Scenic. Canyon bottom is the border between the Spruce Canyon and Coal Canyon WSAs. 0.08 miles managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: closed.	Recommendation: Not Suitable. Canyon bottom is the border between the Spruce Canyon and Coal Canyon WSAs. Oil and gas leasing: closed.	Recommendation: Not Suitable. Canyon bottom is the border between the Spruce Canyon and Coal Canyon WSAs. Oil and gas leasing: closed.
Dolores River Segment #1	RM: 5.9[c] Acres: 1,889	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: NSO.	Recommendation: Suitable-Scenic. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Suitable-Recreational. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal).
Dolores River Segment #2	RM: 6.3[d] Acres: 2,035	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: NSO.	Recommendation: Suitable-Wild. Withdrawn from mineral entry (Three Rivers Withdrawal).	Recommendation: Suitable-Scenic. Withdrawn from mineral entry (Three Rivers Withdrawal).	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal).

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
			Portion managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: closed.	Portion managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	Oil and gas leasing: NSO.
Dolores River Segment #3	RM: 9.9 Acres: 2,899	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: NSO.	Recommendation: Suitable-Scenic. Withdrawn from mineral entry (Three Rivers Withdrawal). Within Two Rivers SRMA. Portion managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Suitable-Recreational. Withdrawn from mineral entry (Three Rivers Withdrawal). Within Two Rivers SRMA. Portion managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Within Two Rivers SRMA. Oil and gas leasing: NSO.
Green River Segment #1	RM: 7.7 Acres: 1,060	Suitability not considered. Partially within the Desolation Canyon WSA. Withdrawn from mineral entry. Oil and gas leasing: mostly closed.	Recommendation: Suitable-Wild. Partially within the Desolation Canyon WSA. Withdrawn from mineral entry (Three Rivers Withdrawal). Partially within Lower Gray Canyon SRMA. Oil and gas leasing: NSO and closed.	N/A because of differing segmentation. (see below).	Recommendation: Not Suitable. Partially within the Desolation Canyon WSA. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO and closed.
Green River Segment #1(a)		Not proposed under this Alternative.	Not proposed under this Alternative.	Recommendation: Suitable-Scenic. Partially within the Desolation Canyon WSA. Withdrawn from mineral entry (Three Rivers Withdrawal). Partially within the Lower Gray Canyon SRMA.	Not proposed under this Alternative.

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
				Oil and gas leasing: closed and NSO.	
Green River Segment #2	RM: 8.1 Acres: 1,471	Suitability not considered. Oil and gas leasing: mostly open with standard stipulations.	Recommendation: Suitable-Recreational. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	N/A.	Recommendation: Not Suitable.
Green River Segment #3	RM: 1.5 Acres: 341	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: open with standard stipulations.	Recommendation: Suitable-Recreational. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO
Green River Segment #4	RM: 12.9 Acres: 2,905	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: mostly open with standard stipulations.	Recommendation: Suitable-Scenic. Overlaps Labyrinth Canyon ACEC. Withdrawn from mineral entry (Three Rivers Withdrawal). Overlaps Labyrinth Rim/Gemini Bridges SRMA. Oil and gas leasing: NSO.	N/A because of river segmentation (see below).	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Overlaps Dee Pass SRMA. Oil and gas leasing: NSO.
Green River Segment #4(a)	RM: 49	Not proposed under this Alternative.	Not proposed under this Alternative.	Recommendation: Suitable-Scenic. Overlaps East bank in Labyrinth Canyon ACEC. Withdrawn from mineral entry (Three Rivers Withdrawal). Overlaps Labyrinth Rim/Gemini Bridges SRMA. Oil and gas leasing: NSO.	Not proposed under this Alternative.

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
Green River Segment #5	RM: 15.8 Acres: 2,577	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: mostly open with standard stipulations.	Recommendation: Suitable-Wild. Withdrawn from mineral entry (Three Rivers Withdrawal). East bank in Labyrinth Canyon ACEC. Overlaps Labyrinth Rim/Gemini Bridges SRMA. About 7.1 miles managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	N/A because of river segmentation (see above).	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.
Green River Segment #6	RM: 29.3 Acres: 5,380	Suitability not considered. Withdrawn from mineral entry. Oil and gas leasing: open with standard stipulations.	Recommendation: Suitable-Scenic. Withdrawn from mineral entry (Three Rivers Withdrawal). Overlaps Labyrinth Canyon ACEC. Overlaps Labyrinth Rim/Gemini Bridges SRMA. Oil and gas leasing: NSO.	N/A because of river segmentation (see above).	Recommendation: Not Suitable. Withdrawn from mineral entry (Three Rivers Withdrawal). Oil and gas leasing: NSO.
Mill Creek Segment #1	RM: 1.4 Acres: 572	Suitability not considered. Oil and gas leasing: NSO.	Recommendation: Suitable-Recreational. Overlaps Mill Creek ACEC. Within the South Moab SRMA. Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps Mill Creek ACEC. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Oil and gas leasing: open with special stipulations.
Mill Creek Segment #2	RM: 4.6 Acres: 1,292	Suitability not considered. Overlaps Mill Creek WSA. Oil and gas leasing: NSO.	Recommendation: Suitable-Scenic. Overlaps Mill Creek WSA. Overlaps Mill Creek ACEC.	Recommendation: Not Suitable. Overlaps Mill Creek WSA. Overlaps Mill Creek ACEC.	Recommendation: Not Suitable. Overlaps Mill Creek WSA. Oil and gas leasing: open with special stipulations.

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
			Within the South Moab SRMA. 3 managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: closed.	Within the South Moab SRMA. Oil and gas leasing: NSO.	
Negro Bill Canyon Segment #1	RM: 7.2 Acres: 1,687	Suitability not considered. Overlaps Negro Bill WSA. Oil and gas leasing: closed.	Recommendation: Suitable-Wild Overlaps Negro Bill WSA. Between the Sand Flat and Colorado Riverway SRMAs. Within Colorado River Corridor ACEC. Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps Negro Bill WSA. Between the Sand Flat and Colorado Riverway SRMAs. Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps Negro Bill WSA. Between the Sand Flat and Colorado Riverway SRMAs. Oil and gas leasing: closed.
Negro Bill Canyon Segment #2	RM: 0.2 Acres: 262	Suitability not considered. Oil and gas leasing: open with special stipulations.	Recommendation: Suitable-Recreational. Between the Sand Flat and Colorado Riverway SRMAs. Within Colorado River Corridor ACEC. 0.08 miles managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Between the Sand Flat and Colorado Riverway SRMAs. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Between the Sand Flat and Colorado Riverway SRMAs. Oil and gas leasing: NSO.
North Fork Mill Creek	RM: 11.2 Acres: 3,027	Suitability not considered. Oil and gas leasing: closed.	Recommendation: Suitable-Wild. Overlaps Mill Creek WSA. Within the South Moab SRMA. Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps Mill Creek WSA. Within the South Moab SRMA. Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps Mill Creek WSA. Oil and gas leasing: closed.

Table 4.102. Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
Onion Creek Segment #1	RM: 2.8 Acres: 726	Suitability not considered. Oil and gas leasing: open with special stipulations.	Recommendation: Suitable-Wild. Within the Colorado Riverway SRMA. Managed to preserve wilderness characteristics. Overlaps Colorado River Corridor ACEC. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Within the Colorado Riverway SRMA. Managed to preserve wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Within the Colorado Riverway SRMA. Oil and gas leasing: open with special stipulations.
Onion Creek Segment #2	RM: 9.7 Acres: 2,420	Suitability not considered. Oil and gas leasing: open with special stipulations.	Recommendation: Suitable-Recreational. Within the Colorado Riverway SRMA. 7.06 miles managed to preserve non-WSA lands with wilderness characteristics. Within Colorado River Corridor ACEC. Oil and gas leasing: closed.	Recommendation: Not Suitable. Within the Colorado Riverway SRMA. 7.06 miles managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Within the Colorado Riverway SRMA. gas leasing: open with special stipulations.
Professor Creek	RM: 7.3 Acres: 1,936	Suitability not considered. Oil and gas leasing: open with special stipulations.	Recommendation: Suitable-Wild Within the Colorado Riverway SRMA. 7.3 miles managed to preserve non-WSA lands with wilderness characteristics. Within Colorado River Corridor ACEC. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Within the Colorado Riverway SRMA. 7.3 miles managed to preserve non-WSA lands with wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Within the Colorado Riverway SRMA. Oil and gas leasing: open with special stipulations.

Table 4.102.Management Proposed for River Segments Considered for WSR Designation, by Alternative

Segment	BLM River Miles (RM) and Acres	Alternative A	Alternative B	Alternative C	Alternative D
Rattlesnake Canyon	RM: 31.6[e] Acres: 8,371	Suitability not considered. Overlaps Desolation Canyon WSA. Oil and gas leasing: closed.	Recommendation: Suitable-Wild. Overlaps Desolation Canyon WSA. Overlaps Book Cliffs Wildlife Area ACEC. Within the Book Cliffs SRMA. Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps Desolation Canyon WSA. Oil and gas leasing: closed.	Recommendation: Not Suitable. Overlaps Desolation Canyon WSA. Oil and gas leasing: closed.
Salt Wash	RM: 0.3 Acres: 96	Suitability not considered. Oil and gas leasing: open with special stipulations.	(Eligibility Determination Deferred)	(Eligibility Determination Deferred)	(Eligibility Determination Deferred)
Thompson Canyon	RM: 5.5 Acres: 1,620	Suitability not considered. Oil and gas leasing: open with standard stipulations.	Recommendation: Suitable-Wild. Within the Dolores River Canyon SRMA. Managed to preserve wilderness characteristics. Oil and gas leasing: closed.	Recommendation: Not Suitable. Within the Dolores River Canyon SRMA. Managed to preserve wilderness characteristics. Oil and gas leasing: NSO.	Recommendation: Not Suitable. Oil and gas leasing: open with special stipulations.

N/A = Not applicable or not considered under that alternative.

*Alternative D includes only the portion from Hittle Bottom to Take Out Beach.

a. Includes 2.0 miles of the Little Delores River, 0.5 miles of Marble Canyon, and 0.3 miles of Star Canyon.

b. Includes 0.3 miles of Kane Springs Creek.

c. Includes 0.3 miles of Fisher Creek.

d. Includes 0.4 miles of Granite Creek.

e. Includes 10.9 miles of Flat Nose George Canyon.

f. Includes 11.2 miles of Flat Nose George Canyon.

Under Alternative B, Beaver Creek (Segment #1), Colorado River (Segments #2 and #6), Dolores River (Segment #2), Green River (Segments #1 and #5), Negro Bill Canyon (Segment #1), North Fork Mill Creek, Onion Creek (Segment #1), Professor Creek, Salt Wash, and Thompson Canyon would be designated as VRM Class I. The remaining segments would be designated as VRM II. Thus, all segments would have direct beneficial protection to their scenic values and indirect benefits to other resource values because VRM Class I and VRM Class II designation impose limits on surface disturbance.

Beaver Creek (Segments #1 and #2), Colorado River (Segments #2, 3, 4, and 6), Dolores River (Segment #3), Green River (Segments #1 and #4-6), Mill Creek (Segments #1 and #2), Negro Bill Canyon (Segments #1 and #2), North Fork Mill Creek, Onion Creek (Segments #1 and #2), Professor Creek, Rattlesnake Canyon, and Thompson Canyon would be managed within SRMAs under Alternative B. The SRMAs would manage recreational activities and enhance these segment's recreational values, and would not affect the other outstandingly remarkable values. SRMA management would not affect the free-flowing nature of the river, and would be in keeping with the tentative classification of scenic.

Beaver Creek (Segments #1 and #2), the Dolores River, Onion Creek, Professor Creek and Thompson Creek would be managed to protect wilderness characteristics under Alternative B. The management of these lands to maintain wilderness characteristics would protect outstandingly remarkable values and would not affect the free-flowing nature of the river.

All river segments would be in a closed or limited to designated routes OHV category River corridors would thus largely be protected from disturbance related to OHV activity. No loss of outstandingly remarkable values from OHV use would therefore be anticipated during the life of the plan.

4.3.14.4.4 ALTERNATIVE C

Under Alternative C, 155 river miles involving the Colorado River (Segments #2, 3(a), 3(b), 4, 5, and 6), Dolores River (Segments #1-3), and Green River (Segments #1(a) and 4(a)) segments would be recommended as suitable for designation into the National Wild and Scenic River System (see Table 4.102). This alternative would be more protective to their outstanding and remarkable values than Alternative D, but less so than Alternative B. Since Alternative A protects the eligibility of all the river segments, it may be more protective than Alternative C.

All remaining river segments not recommended as suitable would be managed as either NSO or closed for oil and gas leasing, as well as precluding other surface disturbing activities. This would result in no surface disturbance. All of the segments recommended as suitable for designation would also be managed as NSO or closed to oil and gas leasing. All segments except for those in the Three Rivers withdrawal (the Green, Colorado, and Dolores Rivers) would be open to mineral entry.

Under Alternative C, Colorado River (Segment #2) would be designated as VRM Class I and Colorado River (Segments #3(a), 3(b), 4, 5, and 6), Dolores River (Segments #1-3), and Green River (Segments #1(a) and 4(a)), would be designated as VRM Class II. These segments would

have beneficial direct protection to scenic and other resource values because the classifications limit surface disturbance. The remaining river segments not recommended would be at risk for adverse impacts to their outstanding and remarkable values because surface disturbing activities could be allowed.

Beaver Creek (Segments #1 and #2), Colorado River (Segments #2, 3(a), 3(b), 4, and 6), Dolores River (Segment #3), Green River (Segments #1(a) and 4(a)), Mill Creek (Segment #2), Negro Bill Canyon (Segments #1 and #2), North Fork Mill Creek, Onion Creek (Segments #1 and #2), Professor Creek, and Thompson Canyon would be managed as SRMAs. This would enhance these segments' recreational values as opportunities would be provide for recreation, and would not affect the other outstandingly remarkable values. It would not affect the free-flowing nature of the river, and would be in keeping with the tentative classification of scenic.

Beaver Creek (Segments #1 and #2), the Dolores River, Onion Creek, Professor Creek and Thompson Creek would be managed to protect wilderness characteristics under Alternative C. The management of these lands to enhance wilderness characteristics would enhance outstandingly remarkable values because surface disturbing activities would be precluded. It would not affect the free-flowing nature of the river.

All river segments would be in a limited to designated routes or closed OHV category, with most of the segments limited to designated routes. River corridors would largely be protected from disturbance related to OHV activity. No loss of outstandingly remarkable values from OHV use would be anticipated during the life of the plan.

4.3.14.4.5 ALTERNATIVE D

No segments would be recommended for designation under this alternative. This alternative would offer the least protections to the WSRs in comparison to Alternatives A, B, and C.

All river segments outside WSAs and outside of the Three Rivers Withdrawal area would be subject to oil and gas leasing under standard lease terms or with timing limitations and controlled surface use stipulations. These segments include Beaver Creek, Segment #6 of the Colorado River, Mill Creek, Onion Creek, Professor Creek and Thompson Creek. All segments except for those in the Three Rivers withdrawal (the Green, Colorado, and Dolores Rivers) would be open to mining claims for locatable minerals. However, as noted under Alternative A, riparian corridors would be avoided based on BLM Riparian Policy and through standard lease terms for oil and gas.

Under Alternative D, all segments not specifically designated VRM Class I or II under other resource decisions would be designated as VRM Class III or IV. Unless other management prescriptions limit surface disturbance in these areas, river segments designated as VRM Class III or IV would be at risk for adverse impacts to their outstanding and remarkable values from surface disturbance, loss of vegetation, habitat fragmentation, and loss of scenery.

Under Alternative D, parts of Colorado River (Segments # 2, 3, 4, and 6), Dolores River (Segment #3), Green River (Segment #4), Negro Bill Canyon (Segment #2), Onion Creek

(Segments #1 and # 2), and Professor Creek would be managed as SRMAs. This would control recreational activities and would enhance these segments' recreational values. SRMA management would not affect the other outstandingly remarkable values. It would not affect the free-flowing nature of the river.

All river segments would be in a limited to designated routes or closed OHV category, with most of the segments limited to designated routes. River corridors would largely be protected from disturbance related to OHV activity. No loss of outstandingly remarkable values from OHV use would be anticipated during the life of the plan.

4.3.14.5 Wilderness Study Areas (WSAs) and Wilderness Areas (WAs)

4.3.14.5.1 WSAs

In all alternatives, WSAs are managed under the Interim Management Plan for Lands Under Wilderness Review (IMP), which directs the BLM to manage an area so as not to impair its suitability for preservation as wilderness. IMP applies to all uses and activities except those specifically exempted from this standard, such as grandfathered uses (BLM 1995). In this Draft RMP, decisions about OHV designations and VRM designation within WSAs will be made. There would be no impacts to WSAs from other resources from implementation of this plan. Table 4.103 presents WSA acreages within the MPA.

Table 4.103. WSA Acreages within the MPA

WSA	Acreage
Behind the Rocks	13,056
Black Ridge Canyons	57
Coal Canyon	60,599
Desolation Canyon	81,363
Floy Canyon	71,900
Flume Canyon	47,823
Lost Spring Canyon	1,625
Mill Creek Canyon	9,841
Negro Bill Canyon	7,556
Spruce Canyon	20,263
Westwater Canyon	29,917
Total	**344,000**

4.3.14.5.1.1 Impacts to WSAs from Travel Management Decisions

Table 4.104 presents the OHV designation, by WSA and by alternative. For WSAs in the "Limited" category, Alternative A limits travel to inventoried routes. Alternatives C and D limits travel to a subset of the inventoried routes, which would be designated.

Table 4.104. OHV Designations in WSAs, by Alternative

WSA	Acres	A	B	C	D
Behind the Rocks	12,635	Limited	Closed	Limited	Limited
Black Ridge	52	Limited	Closed	Limited	Limited
Coal Canyon	60,755	Limited	Closed	Closed	Limited
Desolation Canyon (MFO)	81,603	Limited	Closed	Closed	Limited
Floy Canyon	72,605	Limited	Closed	Closed	Limited
Flume Canyon	50,800	Limited	Closed	Closed	Limited
Lost Spring Canyon	1,624	Limited	Closed	Limited	Limited
Mill Creek Canyon	9,780	Limited	Closed	Closed	Limited
Negro Bill Canyon	7,820	Limited	Closed	Closed	Limited
Spruce Canyon	20,990	Limited	Closed	Closed	Limited
Westwater Canyon	31,160	Limited	Closed	Limited	Limited

Table 4.105 presents the miles of route designated, by WSA, by alternative:

Table 4.105. Miles of Route Designated, by WSA and by Alternative

WSA	Acres	A	B	C	D
Behind the Rocks	12,635	3.55	0	0.9	0.9
Black Ridge	52	0	0	0	0
Coal Canyon	60,755	8.0	0	0	1.5
Desolation Canyon (MFO)	81,603	8.2	0	0	0
Floy Canyon	72,605	23.5	0	0	1.55
Flume Canyon	50,800	10.13	0	0	0
Lost Spring Canyon	1,624	0.25	0	0.8	1.0
Mill Creek Canyon	9,780	1.83	0	0	1.48
Negro Bill Canyon	7,820	3.54	0	0	1.12
Spruce Canyon	20,990	1.0	0	0	0
Westwater Canyon	31,160	22.5	0	1.4	8.4
Totals	**349,824**	**82.5**	**0**	**3.1**	**15.95**

Travel management decisions which close WSAs to motorized travel promote opportunities for primitive and unconfined recreation, prevent additional intrusions, and enhance supplemental values; within the designated OHV category, those decisions which allow the least number of miles open to motorized travel are the most beneficial to these values and WSA management. Alternative B is the most restrictive of motorized travel within WSAs because all WSAs are closed to travel; Alternative B adversely impacts wilderness values the least. Alternative C is less restrictive of motorized travel than is Alternative B, but it is more restrictive than Alternatives A and D.

4.3.14.5.1.2 Impacts to WSAs from Visual Resource Management Decisions

Under all alternatives, WSAs would be designated as VRM Class I. Therefore, the impacts to WSAs from VRM decisions would be the same for all alternatives. VRM Class I allows no change to the existing landscape, thereby preserving the naturalness of the WSAs.

4.3.14.5.2 WAs

In all alternatives, the Black Ridge WA (5,200 acres) would be managed as part of the McInnis Canyons National Conservation Area. Management prescriptions would prevent impacts to the wilderness values of the area.

4.3.14.6 Summary of Impacts

4.3.14.6.1 ACECs

The management prescriptions for ACECs that would have the greatest impacts upon the relevant and important values in ACEC areas would be oil and gas leasing category, VRM designations and OHV/travel management. All fourteen of the potential ACECs (613,077 acres) would be designated under Alternative B, and would be managed with greater protection of their relevant and important values (see Table 2.2 of Chapter 2, Impact Summary Table). Alternative C would designate five of the potential ACECs (63,232 acres), and provides protection of the relevant and important values within those areas. Alternatives A and D would not designate new ACECs, and would be the least protective of relevant and important values. Adverse impacts to potential the relevant and important values could occur under Alternatives A and D.

Acreages within the potential ACECs in the Greater Cisco and Lisbon Valley RFD areas that are open to oil and gas leasing with standard lease terms or timing limitations or controlled surface use stipulations would be vulnerable to development that could degrade or eliminate relevant and important values proposed for protection. The potential Cisco White-tailed Prairie Dog Complex and the Book Cliffs ACECs would be most impacted by oil and gas development (see Table 2.2).

4.3.14.6.2 National Historic Trail

The Old Spanish Trail would be managed to provide for public understanding and enjoyment under all alternatives.

4.3.14.6.3 WSRs

In all action alternatives (B, C, and D), where eligible rivers would be determined suitable, the BLM would manage these segments to protect or enhance the outstandingly remarkable values, tentative classification, and free-flowing nature of these rivers with specific protection allocations within the river corridor (1/4 mile of the high water mark on each side of the river). BLM management is limited to public lands, and is subject to valid existing rights.

Under Alternative A, a suitability determination would not be made, but those river segments that were determined eligible in the *Wild and Scenic Rivers Review Eligibility Determination* for the MFO would remain eligible under this alternative (BLM 2004g. Where BLM manages the shoreline or other lands within the river corridors, they would be managed to maintain the free-flowing nature, outstandingly remarkable values, and tentative classification. Under Alternative B, 267 miles of river would be recommended as suitable, with the greatest beneficial impacts to WSRs. Alternative C would recommend 155 miles of river as suitable. Alternative D would not find any segments suitable.

4.3.14.6.4 WSAs

The management of WSAs would be the same under all alternatives, except for OHV management. Alternative B is the most beneficial to WSA management, followed by Alternatives C, D and A. WSAs would be managed under the Interim Management Plan (IMP), which directs the BLM to manage the area so as not to impair their suitability for preservation as wilderness.

4.3.15 Special Status Species

This section discusses impacts to special status species from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning special status species are described in Chapter 3.

Because of the large number of special status species—including Threatened, Endangered, and Sensitive species—in some cases, it was determined that the most effective way to disclose impacts at the programmatic level would be to analyze the impacts to the habitat cover types used by these species (see Chapter 3 for species and habitat descriptions). Accordingly, for the purposes of analysis, the special status species described in Chapter 3, Section 3.3.16 are grouped here by habitat type, as shown in Table 4.106 below. Impacts to Federally listed species are also analyzed by habitat type, with the exception of some species for which site-specific population or other similar fine-scale data are available. In some areas, based on the limited impact varying by species type, impacts are discussed by alternative to give a more overall description of the impacts resulting from the management action.

4.3.15.1 Analysis Assumptions

In all of the following sections, management actions discussed for each of the management alternatives are in addition to those discussed under Impacts Common to All Alternatives. Furthermore, management actions discussed for Alternatives B, C, and D are in addition to those discussed under both Impacts Common to All Alternatives and Impacts Common to All Action Alternatives. The Proposed Action and alternatives have the potential for adverse impacts on special status species through management actions such as travel management, recreational use of the land, vegetation treatments, and oil or gas development.

Air quality, cultural resources, and paleontology will not be analyzed in detail in this section because protecting air quality, inventorying and protecting cultural resources under Section 106,

and allowing recreational collection of fossils and scientific study of fossils would neither inhibit nor enhance the protection of federally listed wildlife and plant species under the Endangered Species Act. The impacts of the above resource decisions to special status species would be negligible.

It was determined that quantitative analyses would be made for Federally listed species as well as a few BLM Sensitive species selected as representative of a variety of vegetation types. These species include southwestern willow flycatcher (SWFL), endangered Colorado River fishes, Mexican spotted owl (MSO), bald eagle (nesting and wintering), Jones cycladenia, yellow-billed cuckoo, greater and Gunnison sage-grouse, and White-tailed and Gunnison prairie dog. The habitats associated with these species are representative of the habitats of the other special status species (Table 4.106). All habitat impacts analyzed in this section are approximations based on assumptions regarding the potential locations of facilities, vegetation treatments, grazing, and other management decisions.

Acreage calculations used for analysis for SWFL and yellow-billed cuckoo habitat were made using riparian vegetation acreages. Because both species utilize micro-habitats within riparian habitat, all habitat acreage calculations are likely over-estimations for these species.

All references to the Colorado River fishes are specifically referring to the Federally endangered bonytail chub (*Gila elegans*), Colorado pikeminnow (*Ptychocheilus lucius*), humpback chub (*Gila cypha*), and razorback sucker (*Xyrauchen texanus*). These four species are managed similarly, and impacts can typically be analyzed as a group.

The alternatives have the potential for both adverse and beneficial impacts on special status species through management actions such as travel management, recreational use of the land, vegetation treatments, and oil or gas development. Wherever possible, this document quantifies the amount and types of habitats that would be directly disturbed or reclaimed due to such actions. However, it is often difficult to quantify the loss or improvement of quality or condition of a habitat. Subtle increases or decreases in weeds, shrubs, forbs, water availability, undisturbed areas, or birthing or wintering grounds can greatly affect the distribution, health, and survival of a diversity of sensitive plant and animal species. The degree to which these impacts could occur varies by alternative, with alternatives that increase the amount of surface disturbance within special status species' habitats generally having greater potential adverse impacts on these species. Attempts are made to address potential impacts within each action analysis, but the discussions are often qualitative due to the difficulty in measuring such changes.

Additional assumptions for this chapter include the following: (1) implementation of all of the alternatives would be in accordance with existing laws, regulations, and standard management guidelines; (2) actions associated with emergency or public safety would be performed at the discretion of the Authorized Officer; (3) though impacts resulting from implementation of any of the alternatives may extend beyond MPA boundaries, they will be analyzed to their logical conclusion even if they extend beyond MPA boundaries (an example of this would be analyzing impacts to aquatic species, including downstream impacts beyond the MPA boundaries); and that, (4) public land users will comply with the decisions and allocations contained in the alternatives.

Table 4.106. Special Status Species in the MPA, by Habitat Type

Habitat Type	BLM Special Status Species	Federally Listed Species	Designated Critical Habitat
Desert Shrub	**Wildlife**	**Wildlife**	**Wildlife**
	Allen's big-eared bat (*Idionycteris phyllotis*), big free-tailed bat (*Nyctinomops macrotis*), fringed myotis (*Myotis thysanodes*), spotted bat (*Euderma maculatum*), Gunnison prairie dog (*Cynomys gunnisoni*), White-tailed prairie dog (*Cynomys leucurus*), burrowing owl (*Athene cunicularia*) (Map 2-22), short-eared owl (*Asio flammeus*), ferruginous hawk (*Buteo regalis*) (Map 2-22), desert night lizard (*Xantusia vigilis*).	None.	None.
	Plants	**Plants**	**Plants**
	Peabody's milkvetch (*Astragalus pubentissimus* var. *peabodianus*), Cisco milkvetch (*Astragalus sabulous* var. *sabulous*), stage-station milkvetch (*Astragalus sabulous* var. *vehiculus*), Cataract Canyon gilia (*Gilia latifolia* var. *imperialis*), Entrada rushpink (*Lygodesmia grandiflora* var. *entrada*), Shultz' stickleaf (*Mentzelia shultziorum*), Trotter's oreoxis (*Oreoxis trotteri*), Paradox breadroot (*Pediomelum aromaticum* var. *tuhyi*), Jane's globemallow (*Sphaeralcea janeae*), San Rafael globemallow (*Sphaeralcea psoraloides*).	Jones cycladenia (*Cycladenia humilis* var. *jonesii*) (T).	None.
Sagebrush and Perennial Grassland	**Wildlife**	**Wildlife**	**Black-footed ferret**
	Fringed myotis, Gunnison prairie dog, White-tailed prairie dog (Map 2-21), Gunnison sage-grouse, Greater sage-grouse (Map 2-20), burrowing owl, short-eared owl, ferruginous hawk.	Black-footed ferret (*Mustela nigripes*) (E).	No critical habitat rules have been published for the black-footed ferret.
	Plants	**Plants**	**Plants**
	Cataract Canyon gilia, Dolores rushpink.	None.	None.
Oak/Mountain Shrub	**Wildlife**	**Wildlife**	**Wildlife**
	Gunnison prairie dog, short-eared owl.	None.	None.

Table 4.106. Special Status Species in the MPA, by Habitat Type

Habitat Type	BLM Special Status Species	Federally Listed Species	Designated Critical Habitat
Oak/Mountain Shrub, *continued*	**Plants** None.	**Plants** None.	**Plants** None.
Pinyon-Juniper Woodland	**Wildlife** Allen's big eared bat, fringed myotis, Townsend's big-eared bat (*Corynorhinus townsendii*), Lewis's woodpecker (*Melanerpes lewis*), short-eared owl, Western toad (*Bufo boreas*), Eureka mountainsnail (*Oreohelix eurekensis*).	**Wildlife** Mexican spotted owl (MSO; *Strix occidentalis lucida*) (T).	**MSO** Portions of Grand and San Juan Counties. 55,645 acres of designated critical habitat exists within the MPA (Map 2-18).
	Plants Peabody's milkvetch, Dolores rushpink, Entrada rushpink, Trotter's oreoxis, Paradox breadroot, Canyonlands lomatium (*Lomatium latilobum*).	**Plants** Jones cycladenia (T).	**Plants** None.
Conifer and Mountain Shrub	**Wildlife** Allen's big eared bat, big free-tailed bat, fringed myotis, spotted bat, Townsend's big-eared bat, Lewis's woodpecker, three-toed woodpecker (*Picoides tridactylus*), northern goshawk (*Accipiter gentilis*).	**Wildlife** MSO(T).	**Wildlife** None.
	Plants None.	**Plants** None.	**Plants** None.
Riparian and Wetland	**Wildlife** Allen's big eared bat, big free-tailed bat, fringed myotis, cornsnake (*Elaphe guttata*), smooth greensnake (*Opheodrys vernalis*), American white pelican (*Pelecanus erythrorhyanchos*), Bobolink (*Dolichonyx oryzivorus*), northern goshawk, Arizona toad (*Bufo microscaphus*), Western toad.	**Wildlife** Bald eagle (*Haliaeetus leucocephalus*) (T) (Map 2-19), Southwestern willow flycatcher (SWFL; *Empidonax traillii)* (E), Western yellow-billed cuckoo (*Coccyzus americanus occidentalis*)(C).	**Southwestern willow flycatcher** Designated critical habitat for the SWFL includes portions of Washington County in southwestern Utah (USFWS 2005).

Table 4.106. Special Status Species in the MPA, by Habitat Type

Habitat Type	BLM Special Status Species	Federally Listed Species	Designated Critical Habitat
Riparian and Wetland, *continued*	**Fish** Colorado River cutthroat trout (*Oncorhynchus clarki pleuriticus*), bluehead sucker (*Catostomus discobolus*), roundtail chub (*Gila robusta*), flannelmouth sucker (*Catostomus latipinnis*).	**Colorado River Fishes** Bonytail (*Gila elegans*) (E), Colorado pikeminnow (*Ptychochelius lucius*) (E), humpback chub (*Gila cypha*) (E), razorback sucker (*Xyrauchen texanus*) (E).	**Endangered Colorado River Fishes** Designated critical habitat includes portions of the Green River downstream from the Yampa and Colorado Rivers; along the San Juan River from Shiprock, NM to the inflow of Lake Powell; and the 100-year floodplain (Map 2-17).
	Plants Alcove bog orchid (*Habenaria zothecina [Platanthera zothecina]*), alcove rock daisy (*Perityle specuicola*).	**Plants** None.	**Plants** None.
Caves and Rock Crevices	**Wildlife** Allen's big eared bat, big free-tailed bat, fringed myotis, spotted bat, Townsend's big-eared bat, Yavapai mountainsnail (*Oreohelix yavapai*).	**Wildlife** MSO (T).	**Wildlife** None.
	Plants Alcove rock daisy, Canyonlands lomatium.	**Plants** None.	**Plants** None.
Rocky Slopes and Canyons	**Wildlife** Yavapai mountainsnail, common chuckwalla (*Sauromalus ater*).	**Wildlife** MSO (T).	**Wildlife** None.
	Plants Canyonlands lomatium.	**Plants** None.	**Plants** None.

(C) = Candidate for Federal listing.
(T) = Federally listed as threatened.
(E) = Federally listed as endangered.

4.3.15.2 Impacts Common to All Alternatives

Under all alternatives, the BLM would comply with management plans and conservation agreements for special status species as detailed in Chapter 2. Additionally, all special status species-related measures outlined in the BLM's Oil and Gas Stipulations (Appendix C), Conservation Measures and Best Management Practices for Federally Listed Species (Appendix K), and Best Management Practices and Recommended Buffers and Nesting Periods for Raptors (Appendix O) would be followed. Many of the special status species' habitat listed in Table 4.106 would be indirectly protected by the restrictions and buffers in place for the SWFL, yellow-billed cuckoo, endangered Colorado River fishes, MSO, bald eagle, Jones cycladenia, greater and Gunnison sage-grouse, White-tailed and Gunnison prairie dogs, the black-footed ferret, burrowing owl, and ferruginous hawk. Specific protections that are in place for these special status species are outlined following the table.

4.3.15.2.1 Southwestern Willow Flycatcher (SWFL)

In Southwestern willow flycatcher (SWFL) riparian habitat, there would be no surface disturbing activities within 100 feet of suitable riparian habitat under all alternatives, which would reduce long-term adverse impacts to riparian special status species and their habitats within those buffer zones by eliminating disturbance and habitat degradation. Construction and other disruptive activities would not be permitted within a 0.25 mile buffer of occupied SWFL breeding habitat from May 1 through August 15. These requirements would help reduce disturbance levels for breeding birds during the breeding and nesting season. As discussed in the MSO section below, these requirements would help to mitigate the adverse effects of human disturbance on sensitive bird species during breeding and roosting seasons.

4.3.15.2.2 Yellow-billed Cuckoo

In yellow-billed cuckoo habitat, there would be no surface disturbing activities within 100 meters of riparian habitat, which would have long-term beneficial impacts on riparian special status species and their habitats within those buffer zones by eliminating disturbance and habitat degradation. Construction and other disruptive activities would not be permitted within a 100 meter buffer of occupied breeding habitat from May 15 through July 20. These requirements would help reduce disturbance levels for breeding birds during the breeding and nesting season. As discussed in the MSO section, these requirements would help to mitigate the adverse impacts of human disturbance on sensitive bird species during breeding and roosting seasons.

4.3.15.2.3 Endangered Colorado River Fishes

The BLM will continue to cooperate with the UDWR and USFWS to protect habitat for the endangered Colorado River fishes. All water depletions from any portion of the Upper Colorado River drainage basin above Lake Powell have been determined to adversely affect or modify the critical habitat of the four resident endangered fish species (Table 4.106). Any new depletions would require formal Section 7 consultation with the USFWS, and would require implementation of the Conservation Measures dictated in the Programmatic Biological Opinion for depletions to the Colorado River system (USFWS 1987).

Surface disturbing activities are precluded within the 100-year floodplain of the Colorado River, Dolores River, and at the confluence of the Dolores and Colorado Rivers, as well as backwaters (47,840 acres; see Map 2-17, fish habitat map). Surveys and monitoring would be implemented for authorized exceptions to this stipulation that take place within the 100-year floodplain. Loss or degradation of these riparian habitats and all designated critical habitat would require Section 7 consultation with the USFWS. Any exceptions to the stipulation could affect, but are not likely to adversely affect, the endangered Colorado River fishes. The Utah Oil and Gas Pipeline Crossing Guidance would be implemented for all activities occurring near riparian areas (see Appendix H). These requirements would minimize adverse impacts on special status fish species within the MPA because of the associated reductions in human impacts such as grazing and surface disturbing activities (Lentsch and Converse 1997).

4.3.15.2.4 Mexican Spotted Owl (MSO)

There would be no ground disturbing activities allowed within a 0.5-mile radius of known MSO nests. Because healthy, native vegetation is a key component of suitable habitat (food source and shelter for owl prey species), these restrictions would have long-term beneficial impacts on MSOs and other special status species in the same habitat type within the MSO nest buffer zones. MSO Protected Activity Centers (PACs) would be protected as outlined in the MSO Recovery Plan (USFWS 1995). MSO Designated Critical Habitat (55,645 acres) and suitable habitat would also be protected as outlined in the MSO Recovery Plan (USFWS 1995) and would be avoided or use restrictions would be implemented. Within suitable habitat, these would include staying on designated routes or revegetating access routes created by a project, which would help mitigate the adverse impacts of any surface disturbance associated with road construction on MSO prey habitat.

In addition, surveys would be required for temporary activities taking place within 0.5 miles of suitable MSO habitat (see Map 2-18, MSO habitat) during breeding season (March 1 through August 31). For all long-term actions, two years of surveys would be required prior to commencement of the activity. If owls were found during the surveys, no disturbing actions during breeding season, or permanent structures, would be allowed within 0.5 miles of any identified nest sites or PACs. Additionally, noise emissions would be reduced below 45 dBA at 0.5 miles from suitable habitat. This would help reduce the stress of noise on MSOs during the breeding season. Various studies have shown that human presence and noise disturbance leads to a significant reduction in prey handling and delivery by females, which would reduce nest success (Frid 2002; Swarthout and Steidl 2003). These requirements would help to reduce the adverse impacts of human disturbance on MSOs during breeding season.

4.3.15.2.5 Bald Eagle

Activities on BLM lands containing nesting or winter roosting habitat for the bald eagle would be avoided or restricted (depending on the duration and timing of the activity). Raptors would be managed according to the USFWS Guidelines for Raptor Protection from Human and Land Use Disturbances (Romin and Muck 2002) and BLM BMPs. These management requirements would include restrictions and avoidance measures and would include required surveys prior to activity, monitoring during the activity, implementation of seasonal and spatial buffers during the

breeding season of January 1 through August 31 and avoidance of disturbance in riparian areas unless impracticable. No ground disturbing activities or permanent structures would be authorized within one mile of known bald eagle nest sites year-round (2,439 acres). Deviations may be allowed only after appropriate levels of consultation and coordination with the USFWS. Also, no permanent above-ground structures would be allowed within 0.5 miles of a winter roost site, if the structure would result in the habitat becoming unsuitable for future winter roosting by bald eagles.

As discussed in the MSO section, these requirements would help to mitigate the adverse impacts of human disturbance on bald eagles during breeding and roosting seasons.

4.3.15.2.6 JONES CYCLADENIA

Site-specific plant inventories would be required prior to any proposed surface-disturbing projects in suitable Jones cycladenia habitat. Activities that would be avoided in suitable habitat include road construction, land disposal and approval of right-of-way (ROW) corridors, and grazing activities (trailing, salting, trailing, watering, and herding). All motorized travel would be limited to designated routes in suitable Jones cycladenia habitat. The use of herbicide and chemical treatments would be restricted. These avoidance measures and restrictions would help to mitigate the adverse impacts of habitat degradation and fragmentation for the Jones cycladenia.

4.3.15.2.7 GUNNISON AND GREATER SAGE-GROUSE

Major threats to sage-grouse include the installation of roads which leads to destruction of vegetation and increased human activity, and fences and power poles that provide perches and viewing areas for raptors, which leads to an increase in predation levels in these areas (Connelly et al. 2000; Crawford et al. 2004). Additional threats to sage-grouse include reduction in native vegetation, fragmentation of suitable lekking and nesting habitat, and human disturbance during breeding and nesting season. The following plans would be implemented in suitable habitat in the MPA: BLM's National Sage-grouse Habitat Conservation Strategy (BLM 2004c), Strategic Management Plan for Sage-grouse (UDWR 2002), Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats (Connelly et al. 2004), and the Gunnison Sage-grouse Range-wide Conservation Plan (GSRSC 2005). Adherence to BLM plans would reduce adverse impacts to Gunnison sage-grouse and other sensitive sagebrush species in the MPA because of the habitat protections and restrictions on human disturbance specified in these plans. These restrictions include surface disturbance and permanent structures and other human activity in or near leks. Specific spatial and temporal stipulations for sage-grouse are discussed in Section 4.3.15.13.2.1 below.

4.3.15.2.8 WHITE-TAILED AND GUNNISON PRAIRIE DOGS

Prairie dog habitats would be managed in accordance with UDWR and USFWS guidance and the White-tailed Prairie Dog Conservation Assessment. Additionally, cooperative agreements would be developed with other agencies to inventory prairie dog densities and identify suitable habitat for expansion. Adherence to the Conservation Assessment Plan would have beneficial impacts

on White-tailed and Gunnison prairie dogs and other special status species in associated habitats in the MPA because of the habitat protection recommendations relevant to oil and gas development (including buffers around colonies), livestock grazing, and other potential threats.

4.3.15.2.9 Black-footed Ferret

No critical habitat rules have been published for the black-footed ferret. However, the 1988 Recovery Plan states "direct reduction in the area occupied by prairie-dogs has been shown to reduce the number of black-footed ferrets linearly" (USFWS 1988). Therefore, it can be assumed that critical habitat for the black-footed ferret coincides with prairie-dog habitat including areas of short vegetation and bare ground, and that impacts described in this chapter for prairie dogs would be the same for the black-footed ferret. Sagebrush shrubs are among the largest plants found in the areas of preferred black-footed ferret and prairie-dog habitat (UDWR 2002).

4.3.15.2.10 Burrowing Owl

No surface disturbing activities would be allowed within 0.25 mile of a known burrowing owl nest from March 1 through August 31 due to the stipulations developed in cooperation with USFWS (USFWS Guidelines for Raptor Protection from Human and Land Use Disturbances, Appendix O) for oil and gas leasing and other surface disturbance activities. Additionally, no domestic sheep camps, temporary watering sites, or salt and mineral blocks would be allowed within 0.25 mile during the same time period to avoid the congregation of domestic sheep and activity around the nests. Ground squirrel and prairie dog colonies would be maintained to provide habitat and nesting burrows for burrowing owls. As discussed in the MSO section, these requirements would help to mitigate the adverse impacts of human disturbance on burrowing owls during breeding and roosting seasons.

4.3.15.2.11 Ferruginous Hawk

Management actions and impacts for ferruginous hawk would be identical to those described under burrowing owl except that no surface disturbing activities would be allowed within 0.5 mile of a known ferruginous hawk nest from March 1 though August 1, and the activities described above would not be allowed within 0.5 mile during the same time period. This spatial buffer would reduce human disturbances to nesting ferruginous hawks.

4.3.15.3 Impacts of Fire Management Decisions on Special Status Species

4.3.15.3.1 Impacts Common to All Alternatives

Under all alternatives, the Reasonable and Prudent Measures and Terms and Conditions identified in consultation with the USFWS for the Utah Land Use Plan Amendment for Fire and Fuels Management (BLM 2005c) would be implemented in fire-related actions. Maintenance of existing healthy ecosystems and protection of special status species are two of the criteria for establishing fire management priorities. Implementation of these criteria would reduce negative impacts to special status species and their habitats in the MPA by preserving native plant species and assuring that special status species would not be directly affected by fire.

Fuels management actions would occur under all of the alternatives. Wildland fire use may be authorized for special status species habitats, which could negatively impact special status species by burning or cutting of vegetative cover, reducing the overall quantity or quality of habitat or forage, or mortality of individuals due to fire, trampling, or crushing. Indirect impacts to special status species and their habitats could include increased exposure to predators due to reduced vegetation cover, increased soil erosion, or other impacts to habitat quality.

Wildland fire use would not be authorized in the following areas unless reasonable resource protection measures were in place: areas that are known to be highly susceptible to post-fire cheatgrass or other weed invasion, important terrestrial and aquatic habitats, and non-fire adapted vegetation communities (see Special Status Species section of Table 2.2, Summary of Impacts). This measure would also have beneficial impacts on special status species habitat by reducing the spread of weeds and preserving native plant species, thereby ultimately preserving the quality of special status species habitats.

Fuels management actions include surface-disturbing treatments on 5,000 to 10,000 acres annually (dependent on budgetary and time constraints). Over the life of the plan, this would result in a maximum of 75,000 to 150,000 acres of land subject to fuels management. Impacts would be analyzed with site-specific NEPA once it is determined where individual treatments would occur. Fuels management actions include: mechanical and manual treatments, prescribed fire, chemical or biological vegetation control, and aerial/ground seeding.

The LUP Amendment for Fire and Fuels Management indicates that the majority of treatments would occur in pinyon-juniper woodland and sagebrush habitats and would impact the species dependent upon those habitats (Table 4.106). In the long term, however, vegetation treatments would benefit special status species habitat in an area by removing competition from weedy natives and invasive species. Once the competition is removed, a diverse native community has the potential to establish itself in the area, which means more available forage and cover for sensitive wildlife species and potential habitat for sensitive plant species (Stevens 2004).

4.3.15.3.2 Desert Shrub Habitat

Under all alternatives, wildland fire use or fuels management actions and associated surface-disturbing treatments would not be authorized in desert shrub habitats, which are known to be highly susceptible to post-fire cheatgrass or other weed invasion, unless reasonable Resource Protection Measures were in place. Protective measures would result in beneficial impacts because fire management activities that promote weed invasion could adversely impact special status plant species through direct impacts to individuals, competition from weed species, and indirectly impact special status wildlife through short and long-term changes in vegetation composition and structure, and weed-induced destabilization of biological soil crusts.

4.3.15.3.3 Sagebrush and Perennial Grassland and Pinyon-Juniper Woodland

The LUP indicates that the majority of fuels management treatments would occur in pinyon-juniper woodland and sagebrush habitats. Impacts would be analyzed with site-specific NEPA once it is determined where individual treatments would occur. Under all alternatives, fuels

management actions would include surface-disturbing treatments on 5,000 to 10,000 acres annually within the MPA. Over the life of the plan, this would result in a maximum of 75,000 to 150,000 acres of land subject to fuels management.

Impacts to special status species would include trampling or removal of vegetation and associated disturbance to sensitive wildlife species from fire and human presence. In the long term, however, vegetation treatments would potentially benefit special status species habitat by removing competition from weedy natives and invasive species.

4.3.15.3.4 Riparian and Wetland Habitats

Direct, adverse impacts from fire management actions include aquatic habitat degradation and modification including sedimentation and salinization resulting from soil erosion and stream bank destabilization, changes in water chemistry, changes in flow pattern, and possible water withdrawals (USFWS 2002a, BLM 2005c; Trombulak and Frissell 2000). Indirect, beneficial effects of fire management on special status species and their habitats include the reduction of catastrophic wildland fires that cause habitat modification, soil erosion, stream sedimentation, and water quality degradation. Indirect, adverse effects of fire management in riparian areas include the potential for alteration of plant community structure, species composition, and relative abundance of species. Fire is an imminent threat to special status species riparian habitats, as native riparian plants are neither fire-adapted nor are they fire-regenerated, whereby fires in riparian habitats can cause catastrophic, immediate and drastic changes in riparian plant density and species composition (USFWS 2002a). Under all alternatives, wildland fire and fuels management actions would not be authorized in potential special status species riparian habitats (see Section 4.3.15.1).

4.3.15.3.5 All Other Special Status Species Habitats in the MPA

Under all other habitat types, wildland fire use would not be authorized unless reasonable Resource Protection Measures were in place if the habitat is deemed susceptible to post-fire cheatgrass or other weed invasion, important as terrestrial and aquatic habitat for special status species, or a non-fire adapted vegetation community.

4.3.15.4 Impacts of Health and Safety Decisions on Special Status Species

4.3.15.4.1 Impacts Common to All Alternatives

Under all alternatives, abandoned mine lands (AMLs) would be prioritized for area reclamation and mitigation. Site-specific NEPA analysis would be completed on all potential AML projects, thereby preventing adverse impacts to special status species.

4.3.15.4.2 Riparian and Wetland Habitats

Hazardous waste contamination from AML sites could directly or indirectly impact special status species in the short and long-term. Special status fish and amphibian species may be particularly vulnerable to adverse impacts to water quality, which could result in mortality of individuals,

reduced forage or prey availability, or impacts to other habitat qualities. Any impacts to water quality could indirectly impact sensitive wildlife species that utilize affected riparian or wetland habitats through exposure to contaminants or impacts to prey availability or habitat quality.

Under all alternatives, some abandoned mine lands sites would be prioritized due to hazardous waste contamination and water quality issues. The top criteria used to prioritize water-quality-based AML programs include threats to the environment (see special status section of Table 2.2, Summary of Impacts), which takes into account habitat quality for all special status fish species (see Table 4.106). These actions are conducted under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) authority and follow CERCLA processes. These reclamations would help to mitigate for the adverse impacts of poor water quality on special status fish species because the threat of groundwater contamination would be removed. Long-term water quality monitoring would be required.

4.3.15.4.3 Caves and Rock Crevices

In addition to naturally occurring caves and rock crevices, abandoned mining structures are often used as roosting habitat by bats, including sensitive bat species. Of the 18 bat species in Utah, 14 species regularly occur in abandoned mines. One State special status species (Townsend's big-eared bat) has been found exclusively in abandoned mines (Grandison 2004). Of the special status bat species occurring in the MPA (see Table 4.106), three are known to use caves as winter, day, or night roosts (Townsend's big-eared bat, fringed myotis, and spotted bat; Oliver 2000). These species have the highest potential for being adversely affected by reclamation and mitigation of AMLs. Completely sealing off AML entrances could have direct adverse impacts to roosting individuals and populations, which could include the reduction of suitable roosting habitats. Under all alternatives, potential mitigations to avoid and/or minimize impacts to special status bat species would include pre-construction surveys and the installation of bat compatible mine gates and cupolas, which allow bats to pass through but prohibit human entrance. Use of mitigation structures and monitoring would lessen adverse impacts of mine closures on bats.

4.3.15.4.4 All Other Special Status Species Habitats in the MPA

Under all alternatives, impacts to all other special status species from health and safety decisions would be negligible because they do not occur on abandoned mine sites.

4.3.15.5 Impacts of Lands and Realty Decisions on Special Status Species

4.3.15.5.1 Impacts Common to All Alternatives

Lands and realty decisions that could potentially impact special status species include the following: access, easements, leases and permits, utility/transportation systems, exchanges, disposals and withdrawals. Under all alternatives, Wilderness Study Areas (WSAs) and Wilderness Areas would be exclusion areas for ROWs, and ACECs would be avoidance areas. In addition, the withdrawal of 78,333 acres from mineral entry within the MPA would be continued. Under all alternatives, the 65,037 acres from the Three Rivers Withdrawal and 8,096 acres from the Westwater Withdrawal includes critical riparian habitat and would be managed as

NSO. These actions would contribute to the avoidance of both long-term and short-term adverse impacts to riparian-associated special status species (see Table 4.106) in withdrawal areas by removing threats from the surface-disturbing actions associated with lands and realty decisions.

All areas not identified as avoidance or exclusion would be available for ROWs and could be subject to multiple-use terms on a case-by-case basis (BLM 2004a). The use of ROWs for utility and communication infrastructure could have direct, long term, adverse impacts on special status plant and wildlife species habitat due to surface disturbance for utility lines, communication sites, solar and wind energy sites, or pipeline installation, trampling by workers and vehicles during construction activities, impacts to special status bird or bat species and migration routes from wind turbines, and construction of maintenance access roads. Additionally, noise and human presence associated with infrastructure installation could have adverse impacts on special status wildlife species in the MPA.

4.3.15.5.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, the existing utility corridor that runs from Cisco to U.S. Highway 191 would be eliminated, which would help to mitigate for the adverse effects of utility corridors on special status species. In addition, applications for filming permits would have to meet criteria to avoid or minimize impacts to special status species and their habitats. Accordingly, implementation of these minimum impact criteria would help reduce adverse impacts to special status species from filming activities, such as surface disturbance due to vehicle use, noise and other human impacts, and an increased risk of fire.

4.3.15.5.3 Desert Shrub, Sagebrush and Perennial Grassland and Oak/Mountain Shrub Habitats

Under all alternatives, the installation of power poles in these habitats would increase raptor predation on Gunnison prairie dog, White-tailed prairie dog, Greater sage-grouse, and Gunnison sage-grouse by providing hunting perches. Although this is a negative impact on these prey species, it would provide a short-term positive impact on special status raptor species in the MPA (Jacobsen 2005). Alternative A would impact the fewest acres of habitat (26,695 acres), followed by Alternative B (55,408 acres). Greater impacts to special status species would occur under Alternative C (128,293 acres) and Alternative D (156,328 acres) (see Section 4.3.17.4, Table 4.127).

4.3.15.5.4 Pinyon-Juniper Woodland Habitat

Potential impacts to special status species from utility corridor development in pinyon-juniper woodland habitat would be greatest under Alternatives C (41,672 acres) and D (44,189 acres), followed by Alternative B (8,808 acres) and Alternative A (5,345 acres).

4.3.15.5.5 CONIFER/MOUNTAIN SHRUB HABITAT

Potential impacts to special status species from utility corridor development in conifer/mountain shrub habitat would be limited to a maximum of 19 acres under Alternatives C and D, with 9 acres potentially impacted under Alternative A, and no acres impacted under Alternative B.

4.3.15.5.6 RIPARIAN AND WETLAND HABITATS

For Federally listed species, changes in utility corridor widths among alternatives would primarily affect riparian habitat, which is utilized by wintering bald eagles, the four endangered Colorado River fishes, Southwestern willow flycatcher and yellow-billed cuckoo, and as foraging habitat by the Mexican spotted owl, and riparian-associated BLM special status species (see Table 4.106). Table 4.107 below details the acreage and percentage of habitat for these species that is included within utility corridors by alternative. Some overlap may exist among species. Specific adverse impacts of utility corridors on special status species are as described above.

Table 4.107. Federally Listed Species' Riparian Habitat Proposed for Utility Corridors, in Acres and Percent of Total Habitat in the MPA, by Alternative

Species	Alternative A		Alternative B		Alternative C		Alternative D	
	Acres	%	Acres	%	Acres	%	Acres	%
SWFL and Yellow-billed Cuckoo Habitat	143	1	324	2	1,031	8	1,139	8
Colorado River Fish Habitat	41	<1	281	1	565	1	571	1
MSO Foraging Habitat	4,609	1	8,979	2	41,301	7	44,491	8
Bald Eagle Wintering Habitat	1,807	1	4,222	3	16,957	12	17,140	12
Total Habitat Impacted	**9,402**	**<4**	**13,806**	**<6**	**59,854**	**23**	**63,341**	**25**

Under Alternative A, utility corridor widths would remain 1 mile throughout. Under Alternative B, an I-70 utility corridor would be designated with a 100-foot width on each side of the widest ROW corridor. Under Alternative C, a 0.5-mile disturbance width on either side of the I-70 utility corridor would be designated. Also, under Alternative C, a Moab Canyon Utility Corridor would be designated and expanded onto Gold Bar Rim, and two corridors south of Spanish Valley would be combined with 2–3 miles separating the segments, which would increase the number of acres in the MPA with potential to be adversely affected. Under Alternative D, allowable surface disturbance associated with the I-70 utility corridor would be a 1-mile width on each side of the widest ROW corridor, which would further increase the number of acres in the MPA with potential to be adversely affected by surface disturbance associated with these management decisions. Overall, Alternative A would impact the fewest acres of riparian habitat, and would therefore have the lowest potential impacts to riparian special status species, followed by Alternatives B, C, and D, in ascending order (see Table 4.107).

4.3.15.5.7 All Other Special Status Species Habitats in the MPA

No utility corridors are proposed for caves and rock crevices or rocky slopes and canyons habitats. Overall, Alternative A would potentially impact the lowest number of acres across all special status species habitats of the alternatives, followed by Alternatives B, C, and D.

ROW exclusion areas will be managed for wilderness characteristics by alternative, and would include no exclusions for wilderness characteristics under Alternatives A or D, 233,745 acres under Alternative B, and 47,761 acres under Alternative C. Accordingly, the lowest potential impacts to special status species from ROWs in wilderness characteristics areas would occur under Alternative B, followed by Alternative C, and Alternatives A and D, respectively.

4.3.15.6 Impacts of Livestock Grazing Decisions on Special Status Species

4.3.15.6.1 Impacts Common to All Alternatives

Livestock grazing allotments occupy approximately 2,329,900 acres (95% of all lands) within the MPA. Detrimental impacts from grazing could include loss of biodiversity, lowering of population densities, disruption of some ecosystem functions, changes to community organization, and changes to the physical characteristics of both terrestrial and aquatic habitats (Chaneton and Lavado 1996; Fleischner 1994; Olff and Ritchie 1998). Within grazing allotments, special status species may be impacted by trampling, reduced forage or cover vegetation, reduced quality of riparian and wetland habitats, and other impacts to habitat quality or quantity.

Under all alternatives, livestock grazing would be managed according to the Guidelines for Grazing Management to achieve the Standards for Rangeland Health. By adhering to these Standards, the impacts from livestock grazing on special status species are expected to be minimal. Grazing use would not be authorized on approximately 48,220 acres in the MPA, wherein negative impacts to special status species by livestock would be reduced or eliminated.

4.3.15.6.2 Desert Shrub

Grazing can increase salinity in already saline soils (Chaneton and Lavado 1996) and lead to inhibited plant diversity, especially in arid and relatively infertile soils (Olff and Ritchie 1998). Further, changes in salinity in bodies of water such as the Colorado River have been shown to modify species composition within an ecosystem (Galindo-Bect and Glenn 1999; Hart et al. 1998). For these reasons, grazing eventually would reduce the habitat quality for special status species associated with riparian, desert shrub, and sagebrush habitats (see Table 4.106). Accordingly, Alternative B would exclude grazing from the greatest number of acres of potentially saline soils in desert shrub and sagebrush habitats (Table 4.108) and would have the greatest beneficial impacts to special status species, followed by Alternatives A, C, and D, in descending order.

Table 4.108. Acres of Grazing Exclusions in Special Status Species Habitats, by Alternative

Habitat	Alternative A	Alternative B	Alternative C	Alternative D
Desert shrub	13,697	23,880	14,952	13,324
Sagebrush and perennial grassland	3,806	5,569	2,980	1,767
Conifer and mountain shrub	23,155	23,404	22,579	587
Pinyon-juniper woodland	84,301	98,628	71,809	35,369
Riparian/Wetland	1,568	1,852	1,556	862
Agriculture, Developed, Disturbed, Water	316	388	291	238
Invasive Species and Noxious Weeds	64	76	68	67
Total	**126,907**	**153,797**	**114,235**	**52,214**

4.3.15.6.3 Sagebrush and Perennial Grassland and Pinyon-Juniper Woodland Habitats

The recommendations of the National Sage Grouse Habitat Conservation Strategy (BLM 2004c) and the Strategic Management Plan for Sage Grouse (UDWR 2002) would be followed under all alternatives as applicable. These plans are designed to benefit sage grouse species, and would also help avoid adverse impacts to all species associated with the sagebrush and perennial grassland habitat type by setting forth objectives and strategies aimed to retain the quality of these habitats. See Section 4.3.15.2.7, above, for details.

Vegetation treatments for rangeland improvement in pinyon-juniper woodland habitat are proposed under all alternatives. These treatments include plowing and seeding, chaining and seeding, drill seeding, and prescribed fire and seeding. See Table 4.106 to determine which special status species would be impacted by treatments to pinyon-juniper woodland habitat. Potential short-term adverse impacts include mortality of individuals, displacement, and disturbance of habitat. However, in the long term, treatments would open canopy vegetation in or near special status species habitat, thereby improving conditions for re-colonization by native species. For example, the restoration of sagebrush habitats from pinyon-juniper woodland encroachment can be done by cutting or chaining combined with post-treatment seeding (BLM 2004c). Rangeland improvements like this would generally benefit sagebrush habitats and sagebrush dependent species such as the greater and Gunnison sage-grouse.

Under Alternative A, vegetation treatments would be continued on 67,125 acres of pinyon-juniper woodland habitat, including mechanical treatments on 11 allotments (52,976 acres) and prescribed fire treatments on 14,149 acres. Seeding would be done to ensure that forage would be created and enhanced for both wildlife and livestock. Special status wildlife species would likely have fewer adverse impacts with additional AUMs available, and sagebrush-dependent species would experience reduced impacts due to expanded habitat. Alternative B proposes 46,307 acres for vegetation treatments in pinyon-juniper woodland habitat, which is 20,818 acres less than Alternative A. Alternatives C and D would conduct the same vegetation treatments as Alternative B, with an additional 6,900 acres of new vegetation treatment areas.

Because the degree of direct and indirect impacts on special status species depends upon the quality of the treatment and the success rate of revegetating, differences among the alternatives are difficult to quantify. Alternative B would treat the fewest number of acres, followed by Alternatives C and D, with the largest treatment area under Alternative A. However, it is likely that Alternative B would have fewer improvements on special status species sagebrush habitat than the other Alternatives.

4.3.15.6.4 RIPARIAN AND WETLAND HABITATS

Although exclusions would help mitigate the adverse impacts of livestock grazing on water quality and riparian habitat in some areas, each alternative could result in direct and indirect, adverse impacts on riparian special status species in other areas. Indirect adverse impacts include loss of riparian habitat as a result of grazing of palatable native plant species, including vulnerable shrubs and tree saplings. Once disturbed, these areas are more susceptible to invasion by noxious and introduced weeds, which tend to be low value forage and cover species for sensitive wildlife (Popolizio et al. 1994; Kauffman et al. 1983; Sarr et al. 1996). Sensitive bird species relying on riparian habitat (e.g., bald eagles, SWFL, yellow-billed cuckoo) are typically adversely affected by the replacement of native vegetation with introduced species (Saab et al. 1995), as they rely on native riparian trees for nesting and roosting sites and protection from predators. There could also be adverse impacts on endangered and special status fish and amphibian species habitats due to increased overland flow associated with upland soil compaction. Cattle hooves compact the soil on upland slopes, which results in less rainwater infiltration into soils and more overland flows. The result is large, short-lived flows rather than small, perennial flows (Trimble and Mendel 1995).

Under Alternative A, grazing would continue to be excluded from 126,907 acres including 1,568 acres of riparian habitat (see Table 4.108 above). Alternative B would exclude grazing on 153,797 acres including 1,852 acres of riparian habitat which would have the lowest potential for adverse impacts to special status species from grazing under all alternatives. An additional 4,422 acres of riparian habitat would be evaluated using Standards for Rangeland Health and Guidelines for Livestock Grazing Management to determine if exclusion from grazing would improve riparian functioning condition under Alternative B. This would help mitigate the adverse effects of livestock grazing in riparian areas discussed under Impacts Common to All Alternatives. Under Alternative C, grazing would be excluded from 114,235 acres including five riparian areas totaling 1,556 acres. An additional 1,169 riparian acres would also be evaluated to determine if exclusion from grazing would improve riparian functioning condition. Under Alternative D, grazing would be excluded from 52,214 acres, including 862 acres of riparian habitat.

4.3.15.6.5 CONIFER AND MOUNTAIN SHRUB HABITAT

The elimination of grazing could potentially provide short- and long-term benefits to special status species occupying conifer and mountain shrub habitats. As indicated by the acres of grazing exclusions listed in Table 4.108, there would be similar levels of impacts to special status species under all Alternatives, with Alternatives A and B being the least impactful, followed by Alternatives C and D.

4.3.15.6.6 All Other Special Status Species Habitats in the MPA

Livestock grazing would likely have negligible impacts on caves and rock crevices, or rocky slopes and canyons habitats. Nevertheless, the allotments that would be available for grazing in Alternative D, and not in Alternatives A, B and C, include potential canyon nesting and potential breeding habitat for MSO, as well as riparian habitat in the Cottonwood, Diamond and Nash watersheds. Accordingly, Alternative D would have more grazing-related adverse impacts on riparian-, pinyon-juniper woodland-, mountain shrub-, and desert shrub-dependent special status species than Alternatives A, B and C. Overall, Alternative B would impact the fewest acres of special status species habitats, followed by Alternatives C, D and A (Table 4.108).

4.3.15.7 Impacts of Mineral and Energy Development Decisions on Special Status Species

4.3.15.7.1 Impacts Common to All Alternatives

Impacts to special status species associated with minerals exploration include loss and fragmentation of habitats, noise impacts to breeding and foraging activities, crushing or trampling of individuals, and changes in habitat structure or composition due to the introduction and spread of invasive and weedy plant species. In addition to specific protections for special status species (Section 4.3.15.1), approximately 358,806 acres of WSAs and Wilderness Areas would be closed to mineral leasing and development. This would eliminate loss of habitat and disturbance impacts to special status species using pinyon-juniper and desert shrub habitats. All alternatives include the withdrawal of 65,037 acres along the Colorado, Dolores and Green Rivers from mineral entry, thereby eliminating surface disturbing impacts to special status species riparian habitats in this area.

Acreages under the categories Standard Stipulations and Timing Limitations and Controlled Surface Use (special conditions) reflect the total BLM-administered areas within the MPA open to surface disturbing activities (Table 4.1 Predicted Oil and Gas Development and Associated Surface Disturbance for Each RFD Area within the MPA). The impacts of surface disturbing oil and gas activities on native vegetation (present and potential special status species habitat) are discussed in Section 4.3.17.6.

The oil and gas leasing stipulations (Appendix C) apply to all surface disturbing activities, including the disposal of salable minerals. Closed and NSO restrictions do not apply to locatable minerals, although timing limitations and controlled surface stipulations are applicable. Under all alternatives, the projected development of salable and locatable minerals is expected to be minor and similar across all alternatives. A total of 27 acres per year of disturbance is expected due to the extraction of salable minerals and a total of 25 acres per year of disturbance is expected due to the extraction of locatable minerals. The impacts on special status species are therefore minor across all alternatives.

4.3.15.7.2 Desert Shrub, Sagebrush and Perennial Grassland, Pinyon-Juniper Woodland, Conifer and Mountain Shrub Habitats

4.3.15.7.2.1 General Impacts

Potential direct adverse effects of oil and gas development on special status species in desert shrub, sagebrush and perennial grassland, pinyon-juniper woodland, and conifer and mountain shrub habitats (see Table 4.106 and species-specific analysis section below) include placement of facilities or roads within occupied habitat or potential habitat necessary for recovery, resulting in an overall reduction in suitable and potentially suitable habitat and an increase in habitat fragmentation (see Habitat Fragmentation and Road Impacts Analysis, below, and Table 4.113), as well as noise disturbance from construction and operation activities (see Section 4.3.19.6). The acreage of proposed surface disturbance differs by habitat type and alternative.

Overall, Alternative B would pose the least potential impact from salable minerals on these special status species habitats (Tables 4.109 through 4.112; see Table 4.106 for special status species). Alternative C would pose the second lowest impacts, followed by Alternative D. Alternative A would have the greatest impacts, based upon the large number of acres subject to standard stipulations and no limits on timing and/or controlled surface use or surface occupancy.

Table 4.109. Salable Minerals Acres of Desert Shrub Habitat by Alternative

Salable Minerals Category	Alternative A	Alternative B	Alternative C	Alternative D
Standard stipulations	613,154	148,613	229,437	402,178
Timing limitations and/or controlled surface use	0	195,559	281,105	164,370
No surface occupancy	0	249,975	92,081	46,646
Closed to leasing	147,717	166,724	158,249	147,677

Table 4.110. Salable Minerals Acres of Sagebrush and Perennial Grassland Habitat by Alternative

Salable Minerals Category	Alternative A	Alternative B	Alternative C	Alternative D
Standard stipulations	105,679	25,614	39,544	69,317
Timing limitations and/or controlled surface use	0	33,705	48,449	28,330
No surface occupancy	0	43,084	15,870	8,040
Closed to leasing	25,460	28,735	27,275	25,453

Table 4.111. Salable Minerals Acres of Pinyon-Juniper Woodland Habitat by Alternative

Salable Minerals Category	Alternative A	Alternative B	Alternative C	Alternative D
Standard stipulations	607,166	147,162	227,196	398,250
Timing limitations and/or controlled surface use	0	193,650	278,360	162,765
No surface occupancy	0	247,534	91,182	46,191
Closed to leasing	146,275	165,096	156,703	146,235

Table 4.112. Salable Minerals Acres of Conifer and Mountain Shrub Habitat by Alternative

Salable Minerals Category	Alternative A	Alternative B	Alternative C	Alternative D
Standard stipulations	57,974	14,051	21,693	38,026
Timing limitations and/or controlled surface use	0	18,490	26,579	15,541
No surface occupancy	0	23,635	8,706	4,410
Closed to leasing	13,967	15,764	14,963	13,963

4.3.15.7.2.2 Habitat Fragmentation and Road Impacts Analysis for Sage-Grouse

Construction of roads and utility corridors related to oil and gas exploration and extraction fragments habitat for special status species. This fragmentation has various impacts, including direct mortality from construction activities and increased vehicular traffic. Indirect impacts include loss of ecosystem function due to decreases in undisturbed habitat size, barriers to migration, and loss of buffers around key habitat. In terms of special status species, this particularly impacts predators, migratory animals, and habitat specialists (HSUS 2006).

For the purposes of this analysis, the impacts of fragmentation were analyzed for greater and Gunnison sage-grouse. These species were analyzed for four reasons: First, they are species of high interest; second, manuscripts exist to analyze habitat fragmentation for these species; third, our GIS data could support such analyses for these species; and fourth, they represent a dominant habitat type in the RFD areas of the MPA.

Methodology

The first step in analyzing the impacts of human-caused fragmentation on greater and Gunnison sage-grouse species required calculating the total number of acres of BLM-managed suitable habitat available for these species in the MPA. This was done by referring to habitat acreage proposed under Alternative B, which is the most inclusive of BLM-proposed habitat.

Next, the projected number of miles of road open in suitable greater and Gunnison sage-grouse habitats for the life of the plan was calculated for each alternative (see Section 4.3.19.18, Habitat Fragmentation). The existing condition was calculated by analyzing fragmentation from the existing travel plan (Alternative A), which presents the current locations of known roads in the MPA.

The final step calculated the number of acres of greater and Gunnison sage-grouse habitat that could be impacted by vehicle and pedestrian traffic for all alternatives. It was assumed that the potential area of impact consisted of a 400 m area along each side of all proposed roads in the designated habitat. This number is an averaged distance based on applicable literature (Clark and Karr 1979; Connelly et al. 2000; Crawford et al. 2004; UDWR 2002). Note that this analysis could result in an overestimation of habitat degradation because road class and road use were not taken into account. It is possible that infrequently used roads would cause a disturbance less than 400 m for sage-grouse species.

Impacts

Table 4.113 displays the percentage of greater and Gunnison sage-grouse habitat that would be affected by vehicle and pedestrian traffic under each alternative.

Table 4.113. Percentage of Species Habitat Affected by Habitat Fragmentation, by Alternative

Species	Existing Condition	Alternative A	Alternative B	Alternative C	Alternative D
Gunnison Sage-grouse	75%	76%	69%	74%	74%
Greater Sage-grouse	37%	38%	33%	35%	35%

For both species of sage-grouse, Alternative A would affect the greatest percentage of habitat. Alternative A would have virtually identical impacts as currently exist. Alternative B, which places the most restrictions on oil and gas activity, would reduce impacted habitat from the existing condition by 6% (15,276 acres) for Gunnison sage-grouse and 4% (484 acres) for Greater sage-grouse. Alternatives C and D have identical results for both species: 1% and 2% reductions from the existing condition for the Gunnison and sage-grouse species, respectively.

Sage-grouse species are sagebrush habitat specialists. They require sagebrush for food year-round and for cover during the nesting and brood-rearing periods. Because of this relationship, small increments of habitat degradation can lead to disproportionate effects on sage-grouse populations. Conversely, seemingly small amounts of intact (unfragmented) habitat can greatly benefit populations.

Although all alternatives propose oil and gas restrictions around specified distances from active leks (strutting grounds), none of the alternatives propose protection for nesting and/or brood rearing habitat. These activities have been documented an average of 0.6–3.9 miles from the lek, with some females nesting more than 12.5 miles away from a lek (as cited in UDWR 2002). These numbers imply that sage grouse species need a core of unaffected sagebrush habitat for breeding, nesting, and brood-rearing. Fragmentation of this core by roads can effectively reduce the suitable nesting area for this species by means of human-caused noise and physical disturbances to nesting and brooding females. As shown in Table 4.113, the existing project area condition includes a large proportion of fragmented habitat. Of the action alternatives, Alternative B would result in the least amount of fragmented habitat, followed by Alternatives C, D, and A, in ascending order.

4.3.15.7.3 Riparian and Wetland Habitats

Under the Stipulations Applicable to Oil and Gas Leasing and Other Surface Disturbance Categories (Appendix C), surface disturbing activities are not allowed in riparian zones. However, this stipulation could be waived if there are no practical alternatives (such as a utility line to private property). Because of this restriction, combined with the spatial and temporal buffers for surface disturbance for SWFL and the yellow-billed cuckoo (see Section 4.3.15.2 and Appendix C), it is likely that these species and their habitat will experience minimal direct impacts from oil and gas development. However, indirect effects such as sedimentation,

displacement, and the reduction of prey availability could still occur. Table 4.114 lists salable minerals acres in riparian habitat by alternative.

Table 4.114. Salable Minerals Acres of Riparian Habitat by Alternative

Salable Minerals Category	Alternative A	Alternative B	Alternative C	Alternative D
Standard stipulations	17,235	4,177	6,449	11,305
Timing limitations and/or controlled surface use	0	5,497	7,901	4,620
No surface occupancy	0	7,026	2,588	1,311
Closed to leasing	4,152	4,686	4,448	4,151

Development of oil and gas wells requires on average 2.4 acre-feet of water per well for drilling and extraction, which could adversely affect riparian habitat. Each contracting company would identify its own water source and disposal methods for waste products. If this water is taken from sources that feed the Colorado River system, they will contribute to the cumulative water depletions affecting the endangered fish species of the Colorado River system. These impacts would require the implementation of conservation measures required by the Programmatic Biological Opinion for water depletions from the Upper Colorado River system. In spite of this, some indirect, adverse impacts to water quality due to sedimentation associated with soil compaction could occur. Road construction and use on upland slopes results in soil compaction, which results in less rainwater infiltration and more overland flows (Trimble and Mendel 1995). However, the relative amount of reasonably foreseeable mineral development in the MPA, in conjunction with BMPs to minimize erosion, would likely result in relatively minor impacts on these species.

Table 4.115, below, details the projected average acre-feet of water used for each alternative over the life of the plan (15 years). These projections were calculated by multiplying the average water requirement per well (2.4 acre-feet) by the average amount of wells projected for each alternative. Alternative B would have the least amount of water-withdrawal effects on riparian special status species because 42% less water would be withdrawn for drilling and extractions for oil and gas activities, followed by Alternatives C, D, and A, respectively.

Table 4.115. Average Acre-Feet of Water Required for Drilling and Extraction by Alternative, Over the Life of the Plan

Alternative A	Alternative B	Alternative C	Alternative D
1,082	634	1,037	1,078

These impacts would require the implementation of conservation measures required by the Programmatic Biological Opinion for water depletions from the Upper Colorado River system (see Section 4.3.15.2.3). In spite of this, some indirect, adverse effects to water quality due to sedimentation associated with soil compaction could occur. Road construction and use on upland slopes results in soil compaction, which results in less rainwater infiltration and more overland flows (Trimble and Mendel 1995). However, the relative amount of reasonably foreseeable

mineral development in the MPA, in conjunction with BMPs to minimize erosion, would likely result in relatively minor impacts on these species.

4.3.15.7.4 Rocky Slopes and Canyons Habitats

The potential exists for MSOs to occupy the rocky slope/canyon habitat in the MPA. This habitat would be subject to mineral development; however, development activities would not be allowed in potential habitats until presence/absence determinations surveys are complete and lack of MSO occupancy is determined, or during the owl breeding season (March 1 through August 31). Additionally, no permanent disturbing actions would be allowed within 0.5 miles of areas where MSO surveys have found nesting individuals. These measures would reduce disturbance to individual species from oil and gas development, but habitat degradation may occur within MSO suitable habitat.

4.3.15.7.5 All Other Special Status Species Habitats in the MPA

Mineral and energy development would likely have negligible impacts on remaining special status species habitats in the MPA. Overall, Alternative B would impact the fewest acres of special status species habitats, followed by Alternatives C, D and A, respectively.

4.3.15.7.6 Species-specific Analysis

Table 4.116 below lists the acreage and percentage of protected species habitat that is designated as Closed or NSO by alternative. Note that the total habitat acreage used to calculate percentages differs by alternative. Spatially explicit protected habitat information is only available for these 12 special status species. Qualitative impacts to these species could also affect other special status species utilizing similar habitat. See habitat groupings below and Table 4.106 to relate the species listed below with other species within habitat types. All acreages are approximate.

Alternative B proposes the greatest amount of special status species habitat as NSO or closed to oil and gas leasing activities which would benefit special status species, followed by Alternatives C, D, and A, in descending order.

Table 4.117 below displays the estimated annual acreage of oil and gas-related surface disturbance to special status species habitat by alternative. Annual habitat disturbance was estimated by multiplying the percentage of species habitat that is open to minerals leasing by the total acres of predicted annual surface disturbance under each alternative. Because exact well locations are not known at this time, this table serves to show the relative potential for disturbance among alternatives and does indicate exact disturbance acreages for each habitat type. Note that Alternative A does not designate habitat for Gunnison prairie dog, White-tailed prairie dog, Greater sage-grouse, or Gunnison sage-grouse. Additionally, no habitat acreage calculations for SWFL and yellow-billed cuckoo are shown in the table below because all riparian habitat is designated as NSO (see Appendix C).

Table 4.116. Existing Protected Special Status Species Habitat, and Acres and Percentage of This Total Habitat Proposed as Closed to Leasing or NSO, by Alternative

Species	Total Habitat	Alternative A		Alternative B		Alternative C		Alternative D	
		Acres	%	Acres	%	Acres	%	Acres	%
Desert Shrub Habitat									
Jones Cycladenia	26,232	692	3	26,203	100	26,166	100	13,192	50
Sagebrush and Perennial Grassland Habitat									
Greater sage-grouse	11,309	0	0	9,380	83	1,103	58	46	6
Gunnison sage-grouse	244,497	0	0	69,345	28	9060	5	2,670	6
Gunnison prairie dog	12,573	0	0	335	3	159	1	0	0
White-tailed prairie dog	197,361	0	0	132,193	67	304	<1	0	0
Riparian and Wetland Habitat									
SWFL and yellow-billed cuckoo[1]	13,454	5,115	100	10,737	100	8,833	100	7,297	100
Colorado River fish	47,843	19,074	40	44,366	93	42,224	88	38,392	80
Bald eagle (nesting)	2,394	1,523	64	1,635	68	869	36	840	35
Bald eagle (wintering)	141,756	15,829	11	66,756	45	28,137	20	18,591	13
Pinyon-Juniper Woodland (Conifer/Mountain Shrub, Caves/Rock Crevices, Rocky Slopes/ Canyons									
Mexican spotted owl (designated critical habitat-DCH)	55,645	3,606	6	36,758	66	10,974	20	1,189	2
Mexican spotted owl (potential breeding)	335,936	155,423	46	272,843	81	220,080	66	172,002	51
Mexican Spotted Owl (potential foraging)	590,302	179,360	30	327,953	56	230,887	39	184,397	31

[1] Due to the Oil and Gas Stipulations (Appendix C) all riparian areas are managed as NSO.

Table 4.117. Acres of Predicted Special Status Species' Habitat Disturbance in the MPA, by Alternative

Species	Alternative A		Alternative B		Alternative C		Alternative D	
	Acres of Habitat Open to Leasing (%)	Adjusted Predicted Annual Habitat Disturbance (acres)	Acres of Habitat Open to Leasing (%)	Adjusted Predicted Annual Habitat Disturbance (acres)	Acres of Habitat Open to Leasing (%)	Adjusted Predicted Annual Habitat Disturbance (acres)	Acres of Habitat Open to Leasing (%)	Adjusted Predicted Annual Habitat Disturbance (acres)
Colorado River fish	28,416 (60%)	270	3,498 (7%)	19	5,616 (12%)	51	9,446 (20%)	89
MSO designated critical habitat	51,972 (94%)	422	18,887 (34%)	90	44,671 (80%)	347	54,448 (98%)	439
MSO (potential breeding)	179,952 (54%)	242	63,093 (19%)	50	115,835 (34%)	149	163,933 (48%)	219
MSO (potential foraging)	410,056 (70%)	314	262,349 (44%)	117	359,380 (61%)	263	405,917 (69%)	309
Bald eagle nesting	868 (36%)	164	759 (32%)	84	1,525 (64%)	275	1,554 (65%)	291
Bald eagle wintering	125,859 (89%)	401	75,019 (55%)	144	113,633 (80%)	346	123,180 (87%)	390
Jones cycladenia	25,513 (97%)	439	29 (<1%)	0	65 (1%)	1	13,040 (50%)	223
Greater sage-grouse	NMA (100%)	NA	1,928 (17%)	45	806 (42%)	182	781 (94%)	424
Gunnison sage-grouse	NMA (100%)	NA	175,152 (72%)	191	166,312 (95%)	410	38,769 (94%)	420
Gunnison prairie dog	NMA (100%)	NA	12,238 (97%)	257	12,414 (99%)	427	NMA (100%)	NA
White-tailed prairie dog	NMA (100%)	NA	65,502 (33%)	88	124,989 (100%)	431	29,446 (100%)	449

NMA = No Management Actions; NA = Not applicable.

Predicted Annual Surface Disturbance from Oil and Gas Development in MPA (acres): 451 acres under Alternative A, 264 acres under Alternative B, 432 acres under Alternative C, 449 acres under Alternative D.

4.3.15.7.7 Summary of Minerals Impacts by Alternative

4.3.15.7.7.1 Alternative A

Under Alternative A, a total of 1,038,344 acres of land would be open for oil and gas leasing under standard stipulations, and 389,605 acres would be open for oil and gas leasing with special conditions. Much of the increased oil and gas mineral development within BLM administered lands in the MPA would occur primarily in the Greater Cisco Area, and secondarily in the Book Cliffs area. A total of 6,772 acres of surface disturbance is projected for the MPA over the life of the plan (or 451 acres annually). Possible adverse effects are described above under Impacts Common to All Alternatives.

This disturbance would impact SWFL and yellow-billed cuckoo, Colorado River fish, wintering bald eagle, Jones cycladenia, and MSO potential breeding and foraging habitats. Additionally, all Gunnison prairie dog, White-tailed prairie dog and Greater sage-grouse, and Gunnison sage-grouse habitats would be open to oil and gas activities under Alternative A. These actions would lead to the greatest potential for negative effects on these species in comparison with the other alternatives. Similarly, Alternative A allows for the second largest number of acres of disturbance for MSO designated critical habitat and would, therefore, have the largest potential impacts after Alternative D. However, Alternative A would have fewer acres disturbance in bald eagle nesting habitat than Alternatives C and D, and more than Alternative B (see Table 4.117).

4.3.15.7.7.2 Alternative B

Under Alternative B, a total of 264,344 acres of land would be open for oil and gas leasing under standard stipulations, and 543,751 acres would be open for oil and gas leasing with special conditions. A total of 3,963 acres of surface disturbance is projected for the MPA over the life of the plan, which is 2,809 acres less than Alternative A. Much of the increased oil and gas mineral development on BLM-administered lands in the MPA would occur primarily in the Greater Cisco RFD Area, and secondarily in the Book Cliffs RFD Area. Under Alternative B, 92 and 66 acres of annual surface disturbance are projected for these areas, respectively—considerably less surface disturbance than is projected under Alternative A. Alternative B would allow the least amount of predicted surface disturbance for all species listed in Table 4.117. Therefore, this alternative would have the fewest negative impacts on special status species when compared to all other Alternatives (see Table 4.117).

4.3.15.7.7.3 Alternative C

Under Alternative C, there would be a total of 427,273 acres of land open for oil and gas leasing-standard stipulations, and 806,994 acres open for oil and gas leasing with special conditions. A total of 6,483 acres of surface disturbance is projected for the MPA over the life of the plan, which is 289 acres less than Alternative A. Alternative C proposes the second least amount of predicted special status species habitat disturbance for all species except bald eagle nesting. Therefore this alternative has the potential to negatively affect special status species more than Alternative B, but less than Alternatives A and D (see Table 4.117).

4.3.15.7.7.4 Alternative D

Under Alternative D, there would be a total of 797,031 acres of land open for oil and gas leasing-standard stipulations and 590,442 acres open for oil and gas leasing with special conditions. A total of 6,739 acres of surface disturbance is projected for the MPA over the life of the plan, which is 33 acres less than Alternative A. Among alternatives, acres of predicted annual disturbance are highest under Alternative D for nesting bald eagle, MSO designated critical, and Jones cycladenia habitats. Acreages of predicted surface disturbance would be the second highest for all other species (see Table 4.117). Furthermore, there would be no management actions proposed for the Gunnison prairie dog. Accordingly, this alternative would have the second greatest adverse impacts on special status species compared to Alternative A.

4.3.15.8 Impacts of Non-WSA Lands with Wilderness Characteristics Decisions on Special Status Species

Management decisions regarding non-WSA lands with wilderness characteristics would generally reduce adverse impacts to the special status species that occur within their boundaries. Impacts to special status species vary among alternatives based on the acreage managed for wilderness characteristics and the oil and gas leasing stipulations assigned within them.

4.3.15.8.1 Impacts Common to All Alternatives

There are no impacts common to all alternatives for lands with wilderness characteristics.

4.3.15.8.2 Alternative A

Alternative A would not manage any non-WSA lands to protect wilderness characteristics, and would therefore have potentially adverse long-term impacts to special status species and their habitats.

4.3.15.8.3 Alternative B

Alternative B would manage 266,485 acres to protect wilderness characteristics. These lands would be managed as closed to oil and gas leasing and woodland harvest, and other surface disturbing activities would also be precluded. Alternative B would protect the largest number of acres with wilderness characteristics and therefore have the fewest adverse impacts to special status species.

4.3.15.8.4 Alternative C

Alternative C would manage 47,761 acres to protect wilderness characteristics. These lands would be managed as NSO for oil and gas leasing as well as precluding other surface disturbing activities. These actions would reduce adverse impacts to special status species habitat within this acreage, but would have greater adverse impacts than Alternative B.

4.3.15.8.5 ALTERNATIVE D

Alternative D would not manage any non-WSA lands to protect wilderness characteristics, and would therefore have the same potentially adverse long-term impacts to special status species and their habitats as Alternative A.

4.3.15.9 IMPACTS OF RECREATION DECISIONS ON SPECIAL STATUS SPECIES

4.3.15.9.1 IMPACTS COMMON TO ALL ALTERNATIVES

Impacts to special status species from recreation include direct impacts from use of mechanized and non-mechanized vehicles, ground disturbance from trail development, trampling of individuals, habitat fragmentation, and increased access to fragile habitats and species vulnerable to illegal collection. Increased visitor use of recreational areas may also adversely impact special status species through increased noise and human presence. Indirect adverse impacts to riparian areas from recreation could include alternation of plant community structure and species composition, reduction in the relative abundance of species, and changes to stream channel morphology, all of which may contribute to habitat degradation. Management of recreational areas which includes measures to reduce surface disturbance and resource degradation would also reduce these negative impacts on special status species.

The adverse impacts of recreation decisions would be partially mitigated by the required reclamation of disturbed areas to meet the Utah Standards for Public Land Health and Guidelines for Recreation Management (Appendix R) and protective measures outlined for Federally listed species in Appendix C. Off-highway vehicle (OHV) use, non-motorized vehicle use, and dispersed camping are emphasized here due to the emphasis on these activities in the MPA and the potential for direct adverse impacts to Sensitive species and their habitats from these activities throughout the MPA.

Under all alternatives, the Colorado River SRMA would be replaced with the Two Rivers, Colorado Riverway and Dolores River Canyons SRMAs to provide for more focused management. In addition, a River Management Plan, for the Dolores River, and for the Colorado River from the Colorado State Line to Castle Creek would be completed. The recreation restrictions outlined in the Management Plan would lessen the adverse impacts of visitor traffic on special status riparian species. Nevertheless, there would still be surface disturbance associated with the potential trampling and crushing of special status plant species and wildlife habitat by humans, horses, and vehicles. The surface disturbance associated with foot and vehicle traffic could also lead to the introduction of invasive plant species, which can have long-term, adverse impacts on special status species plant and animal habitats as discussed in previous sections. Additional impacts on special status species and their habitat include direct and indirect disturbance of individual wildlife species by human visitors. Wildlife species, birds in particular, are sensitive to traffic and other human-related noise. Traffic noise has been shown to directly interfere with bird vocal communication, which affects territorial behavior and mating success (Reijnen and Foppen 1994). Increased road traffic would also potentially increase the risk of direct mortality to some special status species due to vehicle impacts; carrion-eating raptors are especially vulnerable.

Under all alternatives, dispersed camping would be allowed where not specifically restricted. Dispersed camping could lead to an increase in trampling and noise impacts to special status species and their habitats, which could have an adverse effect on individuals and populations. Dispersed camping may be closed seasonally or as impacts or environmental conditions warrant. Management actions limiting camping, wood gathering, firewood cutting, and requiring the use of fire pans and portable toilets would be carried forward in all alternatives.

4.3.15.9.2 Desert Shrub, Sagebrush and Perennial Grassland, Oak/Mountain Shrub, Pinyon-juniper Woodland and Conifer and Mountain Shrub Habitats

All alternatives would establish focus areas for motorized and multi-use recreation. Recreational OHV and mechanized travel would be consistent with area and route designations described in the travel management plan. The short and long term adverse effects of OHV use are varied and complex. Short-term adverse effects include human presence and noise disturbances (some species have become habituated to certain noises). Long-term adverse effects include habitat fragmentation from roads and cross-country riding, soil compaction, increased erosion, and reduced air quality. These impacts can reduce habitat quantity and quality for special status species. These effects can occur within any habitat type, and can affect a diverse range of species. For an annotated bibliography of the environmental effects of OHV use, see Stokowski and LaPointe (2000). Table 4.113, above, provides a relative comparison of the amount of habitat disturbance and fragmentation that would occur in the dominant sagebrush steppe habitat type under each alternative.

Some of the SRMAs (and one area within the Moab ERMA) within the MPA would include special "non-motorized focus areas" under some of the alternatives. Not all of the SRMAs would contain these focus areas, and for those that would contain them, the size of the areas would vary by alternative. These non-motorized focus areas would be set aside for recreational activities that do not require motorized vehicles. Each area would have a slightly different emphasis; in general, these activities could potentially include hiking, mountain biking (including specialized speed events), ecological study, equestrian use, mountain climbing, and BASE jumping. The restriction of motorized vehicles from these focus areas would alleviate both short- and long-term impacts on special status species in these areas by decreasing human traffic, noise, and habitat disturbance resulting from OHV use (Table 4.118).

Table 4.118. Acres of Designated Non-motorized Focus Areas, by Alternative

SRMA Area	Alternative A	Alternative B	Alternative C	Alternative D
Canyon Rims SRMA	0	3,642	3,642	0
Colorado Riverway SRMA	0	37,277	33,451	1,287
Labyrinth Rims/Gemini Bridges SRMA	0	43,561	38,013	0
South Moab SRMA	0	39,646	39,646	0
Two Rivers SRMA	0	23,479	23,479	0
Moab ERMA (Book Cliffs Area)	0	335,457	335,457	141,679
Total	**0**	**483,062**	**473,688**	**142,966**

Under Alternative A, the Book Cliffs area, Cameo Cliffs SRMA, and the White Wash Sand Dunes would remain open to OHV use. These areas consist of pinyon-juniper, conifer and mountain shrub, and sagebrush and perennial grasslands habitats. Special status species utilizing these habitats would be adversely impacted by OHV use in these areas (see Table 4.106) as described in Impacts Common to All Alternatives, above. In the Colorado Riverway SRMA, Labyrinth Rims/Gemini Bridges area, Sand Flats SRMA, South Moab area, and the Moab Extensive Recreation Management Area (ERMA), motorized and mechanized travel would be restricted to designated routes, partially mitigating for the adverse impacts of OHV use in pinyon-juniper and desert shrub habitats (see Table 4.106). Areas that exclude motorized recreation would reduce adverse impacts to special status species because they help to mitigate the impacts of OHV use. While Alternative A limits some OHV use to designated routes, it does not set aside any acreage specifically for non-motorized recreation. Therefore, any of the other alternatives would be more beneficial for special status species in this respect.

Under Alternative A, management aspects of the South Moab area would limit camping to designated sites and wood gathering would not be allowed, thereby limiting impacts to special status species in pinyon-juniper woodland habitats. Adverse impacts of wood gathering are discussed under Section 4.3.15.18 of this chapter.

Under Alternative B, a total of 483,062 acres would be designated non-motorized focus areas (see Table 4.118) and the Book Cliffs SRMA, Colorado Riverway SRMA, and Dolores River Canyon SRMA would be managed with an emphasis on non-mechanized recreation. The Cameo Cliffs SRMA would provide opportunities for motorized, mechanized, non-mechanized hiking, and equestrian activities. Additionally, the Moab Slickrock Bike Trail would be closed to all motorized vehicles. The remainder of BLM lands not established under this alternative as an SRMA would be managed as a Moab Extensive Recreation Management Area (ERMA), where 335,457 acres would be managed for non-mechanized recreation. The majority of these areas consist of pinyon-juniper woodland and desert shrub habitats; therefore the exclusion of motorized vehicles from these areas would help to avoid both short- and long-term impacts resulting from OHV use for special status species utilizing these habitats (see Table 4.106). Alternative B would pose the least adverse impacts to special status species from OHV use of the alternatives.

Under Alternative B, Special Recreation Permits (SRP) would be given to groups with an emphasis on supporting conservation of natural and cultural resource values. Organized group permits would be required for groups with 15 or more vehicles, which would help to reduce adverse effects associated with visitor use. Adverse impacts due to heavy vehicle use described above under Impacts Common to All Alternatives would likely be incurred, although they would be fewer than under any other alternative. In the Colorado Riverway SMRA, Labyrinth Rims/Gemini Bridges SMRA would provide designated camping sites. The Bartlett/Tusher/Courthouse/Ten Mile area would be closed to camping. These actions would help to avoid the adverse effects of dispersed camping on pinyon-juniper woodland and desert shrub associated species (see Table 4.106).

Under Alternative C, a total of 473,688 acres would be designated non-motorized focus areas (see Table 4.118). Impacts from the Cameo Cliffs SRMA, Canyon Rims SRMA, and Dolores

River Canyon SRMA, would be the same as under Alternative B. In the Colorado River SMRA, a non-motorized focus area would be established on 33,573 acres, which is 3,740 acres less than Alternative B. The Labyrinth Rims/Gemini Bridges SMRA (300,650 acres) would be managed the same as under Alternative B with the following differences: 27,893 acres of non-motorized focus area would be established, and 53,740 acres would be established for either motorized backcountry touring, motorized sport venues, or open OHV areas. Impacts from the Sand Flats SRMA would be the same as under Alternative B except that the high-use Moab Slickrock Bike Trail would be closed to all four-wheeled vehicles and ATVs (motorcycles would be allowed). The South Moab SRMA would be established and managed similarly to Alternative A, except for an additional emphasis on non-motorized trails. Under this alternative, 39,646 acres of non-motorized focus areas and a 41-acre motorized focus area would be established. ERMA lands would be managed identically to Alternative B, except that the Upper Fisher Mesa (1,365) would also be managed to emphasize mountain biking. Alternative C would pose greater impacts to special status species from OHV use than Alternative B, but less than Alternatives D or A, respectively.

Under Alternative C, special recreation permits would be given for a wide variety of uses. Organized group permits would be required for groups with 25 or more vehicles, which would create an increased risk of adverse impacts to special status species habitats relative to Alternative B.

Under Alternative D, a total of 142,966 acres would be designated non-motorized focus areas (see Table 4.118). Impacts on special status species and their habitat in the Book Cliffs area and Cameo Cliffs area would be the same as under Alternative C. Instead of establishing a Labyrinth Rims/Gemini Bridges SRMA, the Dee Pass SRMA (60,939 acres) would be established. This area would consist of the Dee Pass motorized trail system and the White Wash Sand Dunes open OHV area (3,064 acres). Open OHV use in the Dee Pass SRMA could be detrimental to special status species utilizing desert shrub and pinyon-juniper habitats as described above in Impacts Common to All Alternatives. The ERMA areas would be managed the same as under Alternative C except that the Book Cliffs area (141,679 acres) would be managed for low frequency non-mechanized recreation. No new mechanized or motorized recreation would be established in the Book Cliffs area. This action would primarily reduce adverse impacts to species in pinyon-juniper woodland and conifer and mountain shrub habitats (see Table 4.106). Alternative D would pose fewer impacts to special status species from OHV use than Alternative A, but would be more impactful than Alternatives B or C, respectively.

Under Alternative D, special recreation permits management would be the same as under Alternative C except for the following: Organized group permits would be required for groups with 50 or more vehicles, which represents a concomitant increase in disturbance risk in relation to Alternative B. Overall, Alternative B would pose the lowest impacts to special status species from dispersed camping and related activities, followed by Alternatives C, D, and A, respectively.

4.3.15.9.3 Riparian and Wetland Habitats

Under all action alternatives, the BLM would consider and, where appropriate, implement management methods to protect riparian resources and riparian-associated special status species habitat. Management methods may include: limitations of visitor numbers, camping and travel controls, implementation of fees, alteration of when use takes place, and other similar actions. Additionally, information would be provided to the public concerning the value of riparian wildlife habitat. These management and education efforts would reduce the adverse effects of visitor traffic on riparian associated special status species and their habitat.

Under Alternative B, in the Colorado Riverway SMRA the north shore of the river would be managed for high quality bighorn sheep habitat. An additional emphasis would be placed on the protection of riparian values in the Kens Lake area (South Moab SRMA). Under Alternatives C and D, no competitive motorized events would be allowed in the Cameo Cliffs SRMA to maintain riparian values in a current or improved condition. Under Alternative C, this same goal for riparian values would be in place in the Utah Rims SRMA. All of these actions would reduce adverse impacts to special status species living in riparian habitats by improving habitat quality and limiting impacts from recreation in riparian areas as described above in Impacts Common to All Alternatives.

4.3.15.9.4 Caves and Rock Crevices and Rocky Slopes and Canyons Habitats

Recreation activities such as climbing and canyoneering have the potential to impact caves and rock crevices and rocky slopes through increased access, therefore impacting canyon habitats. Dispersed recreation, such as rock climbing and canyoneering, in these habitats could potentially adversely impact roosting and hibernation sites for special status bat species, nesting MSO, and the alcove bog orchid which occurs in hanging garden and seep habitats in canyon. Adverse impacts may be greater under Alternative C in the Colorado Riverway SRMA, due to a semi-developed campground to accommodate rock climbers as well as developments for the Wall Street Sport Climbing Focus Area. These activities may encourage more visitors and therefore lead to increased impacts through increased human presence.

4.3.15.10 Impacts of Riparian Decisions on Special Status Species

4.3.15.10.1 Impacts Common to All Alternatives

Under all alternatives, riparian resources would be managed to promote the proper functioning condition (PFC) of riparian resources. Proper functioning condition includes the presence of adequate vegetation, landforms, or large woody debris, which may be used by sensitive fish species for shelter and as habitat for forage, further improving habitat quality. Working towards PFC of riparian resources would be beneficial to all species utilizing riparian habitats. In particular, the promotion of adequate vegetation would imply improving habitat quality for riparian special status species. The SWFL recovery plan would be implemented in all suitable habitat areas. This plan would protect riparian areas determined as SWFL habitat from over-use and destruction (USFWS 2002d). Not only would this benefit the flycatcher, but other species utilizing these riparian areas would also benefit.

4.3.15.10.2 IMPACTS COMMON TO ALL ACTION ALTERNATIVES (B, C AND D)

Under all action alternatives, riparian restoration treatments would be allowed in riparian areas. These treatments would have both beneficial and adverse effects on vegetation in riparian habitat. Long-term, beneficial effects would include reduction of weed populations and creation of favorable conditions for establishment of native species. This, in turn, would improve riparian habitat for special status wildlife species. Short-term, adverse effects would include crushing and inadvertent removal of special status plant species during the treatment process. There could also be short-term adverse effects on special status fish species habitat due to increased overland flow associated with soil compaction on soils adjacent to riparian areas. The long-term, beneficial impacts of proper riparian functioning would outweigh short-term adverse impacts to special status species.

Under all action alternatives, no surface disturbing activities would be allowed in riparian areas (Appendix C). Except where withdrawn, they would be open to mineral entry. These restrictions would greatly decrease the intensity of the effects of surface disturbance on riparian habitat in the MPA because the adverse impacts of surface disturbances from minerals development would be avoided (see Section 4.3.15.7 for a description of impacts).

4.3.15.10.3 ALTERNATIVE A

Effects of riparian decisions on special status species under Alternative A are discussed in Impacts Common to All Alternatives.

4.3.15.10.4 ALTERNATIVE B

Under Alternative B, some riparian areas would be closed to livestock grazing, while others would be subject to seasonal restrictions. These restrictions would lessen the number of acres of special status species habitat subject to the adverse impacts from surface disturbance in sensitive riparian areas. This alternative would be less impactful to special status species and their habitats than Alternatives A and D, and would have the same impacts as Alternative C.

4.3.15.10.5 ALTERNATIVE C

Under Alternative C, the impacts of riparian management decisions on special status species and their habitats would be the same as for Alternative B, with fewer adverse impacts than Alternatives A or D.

4.3.15.10.6 ALTERNATIVE D

The impacts of Alternative D on special status species and their habitats would be similar to Alternative A, with greater potential adverse impacts than Alternatives B and C.

4.3.15.11 Impacts of Soils and Watershed Decisions on Special Status Species

4.3.15.11.1 Impacts Common to All Alternatives

Under all alternatives, all floodplains and riparian/wetlands would be managed in accordance with Executive Order 11988, which would protect the quality of stream water and Federally listed species habitat by requiring a site-specific NEPA analysis prior to disturbance within a floodplain. Also, all uses in the MPA would be managed to minimize and mitigate damage to soils, and activities located in areas with sensitive soils would be subject to site-specific NEPA. These restrictions would decrease the number of acres in the MPA subject to the adverse effects on special status species and riparian and rocky slopes and canyons habitats associated with surface-disturbing activities (see Table 4.106). This includes the indirect effects of potential stream water contamination associated with increased sedimentation from runoff associated with disturbed areas (see Chapters 3 and 4, Soils and Watershed).

4.3.15.11.2 Impacts Common to All Action Alternatives (B, C and D)

All action alternatives would prohibit surface disturbing activities within 100-year floodplains, 100 meters of riparian areas, public water reservoirs, and 100 meters of springs (Oil and Gas Stipulations, Appendix C). This would help to mitigate the adverse effects of these activities on riparian-associated special status species (described in Section 4.3.15.7 of this chapter; see Table 4.106).

Timing limitation stipulations prohibiting surface disturbing activities would be applied to all slopes in the Book Cliffs greater than 30% from November 1 through April 30. A controlled use stipulation would be applied for all slopes in the MPA greater than 30%, and a timing limitation stipulation would be applied, prohibiting all surface disturbing activities on 330,142 acres of saline soils from December 1 through May 31. These restrictions and stipulations would help to decrease erosion and the attendant habitat degradation for special status species using pinyon-juniper, desert scrub, and rocky slopes and canyons habitats (see Table 4.106). This action would also help to mitigate adverse impacts on special status fish species and their habitat due to increased overland flow associated with upland soil compaction. Special status species in pinyon-juniper woodland habitat would benefit most from the large number of acres protected from surface-disturbing activities due to slope (200,559 acres). Table 4.131 in the Vegetation Section (Acres of Each Vegetation Type Protected Due to Slope Steepness Category) provides the total number of acres of each vegetation type in the MPA with slopes greater than 30%.

Grazing can increase salinity in already saline soils (Chaneton and Lavado 1996) and lead to inhibited plant diversity, especially in arid and relatively infertile soils (Olff and Ritchie 1998). Further, changes in salinity in bodies of water such as the Colorado River have been shown to modify species composition within an ecosystem (Galindo-Bect and Glenn 1999; Hart et al. 1998). For these reasons, grazing eventually would reduce the habitat quality for special status species associated with riparian, desert scrub, and sagebrush habitats (see Table 4.106). Alternatives that would manipulate grazing in the fewest acres of allotments would reduce impacts on highly saline soils and salinity in the Colorado River drainage. Alternative B would exclude grazing from the greatest number of acres of potentially saline soils in desert shrub and sagebrush habitats (see Table 4.108), followed by Alternatives C, D, and A, in descending order.

4.3.15.11.3 ALTERNATIVE A

Under Alternative A, grazing would be manipulated on portions of ten allotments. Additionally, surface disturbing activities would be prohibited on 313,800 acres of Mancos Shale from November 1 through April 30. Both of these actions would lessen impacts on saline soils and reduce salinity in the Colorado River Drainage, which would help to mitigate for adverse impacts on special status species utilizing riparian habitats (see Table 4.106). Specific impacts are described in Section 4.3.15.7 of this chapter.

4.3.15.11.4 ALTERNATIVE B

Under Alternative B, the Castle Valley and Mill Creek municipal watersheds would be closed to oil and gas leasing and other surface disturbing activities (10,321 acres). This would reduce impacts primarily to pinyon-juniper woodland associated special status species and habitats in this watershed by avoiding the adverse impacts of oil and gas development described in Section 4.3.15.7 of this chapter (see Table 4.106). Watershed Management Plans would be developed and implemented for 17 areas under this alternative, and would generally reduce adverse impacts to special status species due to additional restrictions on human activities, grazing, and other surface disturbances.

A timing limitation for surface disturbing activities would be applied to 330,142 acres of Mancos Shale. This is 16,342 acres more than Alternative A, and so would be more effective at mitigating adverse impacts on special status species that utilize riparian habitats. Overall, Soils and Watershed decisions under Alternative B would provide the greatest level of protection to special status species of the alternatives.

4.3.15.11.5 ALTERNATIVE C

Under Alternative C, an NSO stipulation to oil and gas leasing and other surface disturbing activities would be applied in the Castle Valley and Mill Creek municipal watersheds. This stipulation would help to mitigate for the adverse effects of oil and gas development on pinyon-juniper woodland associated special status species (see Table 4.106), but to a lesser degree than Alternative B, which would avoid these effects.

Watershed Management Plans would be developed and implemented for 8 areas—9 fewer areas than under Alternative B. Although these plans would be beneficial for these areas, this action would have greater adverse impacts than Alternative B.

Effects of management actions regarding timing limitations on Mancos shale would be identical to that described under Alternative B. Alternative C would have greater adverse impacts than Alternative B and less impacts than Alternatives A or D, respectively.

4.3.15.11.6 ALTERNATIVE D

Under Alternative D, the impacts of soils and watershed management decisions on special status species and their habitats would be similar to Alternative A, except there would be no timing

limitations for surface disturbing activities occurring on Mancos Shale. The allowance of surface disturbance on Mancos Shale in the winter could add to salinity in the Colorado River drainage and increase adverse impacts on special status species utilizing riparian habitats.

4.3.15.12 Impacts of Special Designations Decisions on Special Status Species

4.3.15.12.1 Impacts Common to All Alternatives

Special Designation areas, such as Areas of Critical Concern (ACECs), Wilderness Study Areas (WSAs), Wilderness Areas, and Wild and Scenic Rivers would generally reduce long-term impacts to special status species that occur within their boundaries. Impacts to special status species vary among alternatives based on the acreage of these specially designated areas and the oil and gas leasing stipulations assigned within them. ACECs are designated to protect identified relevant and important values such as cultural resources, scenic qualities, and natural systems. ACEC designation would reduce impacts to special status species and habitats by limiting human activity and surface disturbances, preserving habitat, and limiting noise.

Wilderness Study Areas (WSAs) are established in order to provide for the protection of wilderness character and for the use and enjoyment of visitors in a manner that leaves it unimpaired for future use. By definition, no surface disturbance, permanent new development, or rights-of-way would be allowed in the WSAs; the lands would be closed to oil, gas, and mineral leasing. Under all alternatives, where ACECs overlap WSAs, WSA management would take precedence. This land would be managed according to the Interim Management Policy and Guidelines for Lands Under Wilderness Review (IMP).

Under all alternatives, any river segments found suitable for designation as a Wild and Scenic River (WSR) would be recommended to Congress. Once identified—but prior to their official designation by Congress—these river segments would be managed to protect their free-flowing condition and outstandingly remarkable values. These qualities would be maintained within 1/4 mile on each side of the river. The BLM would not seek water rights in these segments, and OHV travel would be limited to designated routes.

Most of the proposed ACECs in the MPA would only be established under one or two of the alternatives. See Section 4.3.14 Special Designations for details on ACECs by alternative. Under all alternatives, when an ACEC is established it would be designated NSO or Closed for oil and gas exploration and development. Oil or gas development would still be permitted to occur beneath the surface of land within an NSO designated portion of an ACEC, but it would have to be pursued through horizontal drilling or on State or private land within the ACEC boundaries. An exception to the NSO designation could be authorized if the use is consistent and compatible with protection or enhancement of the resource values or if the use would provide suitable opportunities for public enjoyment of these resources. Due to these possible exemptions, an ACEC should not be considered blanket protection for special status species resources.

As stated above, some of the proposed ACECs would not be established under certain alternatives. In those situations where an ACEC is not established, the land would be managed in a variety of ways (see Chapter 2, the Alternatives Matrix), but would not be comprehensively

designated NSO or Closed for oil and gas development. This means that a comparative analysis of the management (specifically relating to oil and gas leasing categories) of the ACECs under each alternative would be the best representative of potential impacts of Special Designation decisions on special status species. Impacts of surface disturbing oil and gas activities on special status species and their habitats include direct and indirect human-caused disturbance (i.e., vehicular traffic, trampling of vegetation, noise, and human presence) of individual species and their habitats. Further discussion of the qualitative impacts of surface disturbing oil and gas activities on native vegetation (special status species habitat) can be found in Section 4.3.17.6.

Under all alternatives, all designated ACECs would be avoidance areas for all rights-of-way, including wind, solar energy and communication sites. Prohibiting these uses within ACECs would assist in preventing adverse impacts to special status species related to surface and human-caused disturbances. Regardless of whether or not an ACEC is established, OHV use would generally be permitted on at least some portion of the MPA. Impacts of OHV use on wildlife species and their habitats are discussed in Section 4.3.19.13.

4.3.15.12.2 Desert Shrub and Pinyon-Juniper Woodland Habitats

In many proposed ACECs, pinyon-juniper woodland is the most prevalent habitat; though a few ACECs, including Cisco and White Wash, are dominated by desert shrub. Special status species that primarily use these habitats would experience the most protection under ACEC designation.

Under Alternative A, none of the proposed ACEC sites would be established with the exception of the existing 605 acre Negro Bill ONA. The management of oil and gas leasing within most ACECs under this alternative would include Standard and Timing stipulations. Specifically, 47% of the land within the proposed ACEC sites would be managed as Open (Standard or Timing stipulations), while 53% of the land would be Closed (NSO or Closed) to oil and gas production.

Under Alternative B, all of the proposed ACEC sites would be established. The management of oil and gas leasing within all thirteen ACECs under this alternative would exclude Standard and Timing stipulations and allow only NSO or Closed categories. Specifically, 0% of the land within the proposed ACEC sites would be managed as Open (Standard or Timing stipulations), while 100% of the land would be Closed (NSO or Closed) to oil and gas production. The acreage of Federally listed special status species that would be included in the ACECs, and therefore be managed as NSO or Closed, is shown in Table 4.119 below. ACECs are only listed if they encompass habitat for the species listed.

Under Alternative C, five of the thirteen proposed ACEC sites would be established. The management of oil and gas leasing within the ACECs under this alternative would include a mix of Standard, Timing, NSO, and Closed stipulations. Specifically, 34% of the land within the proposed ACEC sites would be managed as Open (Standard or Timing stipulations), while 66% of the land would be Closed (NSO or Closed) to oil and gas production (Table 4.120).

Table 4.119. Special Status Species Habitats Included within ACECs for Alternative B

ACEC	SWFL and Yellow-billed Cuckoo	Colorado River Fish	MSO Critical Habitat	MSO Breeding Habitat	MSO Foraging Habitat	Bald Eagle Nesting	Bald Eagle Wintering	Jones Cycladenia
Behind the Rocks	131	315	479	7,784	2,832	0	507	0
Book Cliffs	1,420	2,900	0	128,194	154,882	0	9,669	0
Canyon Rims	17	0	13,409	4,101	11,215	0	6,667	0
Cisco White-Tailed Prairie Dog Complex	757	656	0	1,068	571	582	2,281	0
Colorado River Corridor	944	8,335	0	18,655	8,295	0	7,534	24,370
Cottonwood-Diamond Watershed	423	0	0	10,107	22,115	0	0	0
Highway 279/Shafer Basin/Long Canyon	416	4,529	9,349	6,570	1,923	0	549	0
Labyrinth Canyon	1,461	7,197	0	4,037	1,087	0	96	0
Mill Creek Canyon	342	0	0	4,103	7,506	0	0	0
Ten Mile Wash	382	0	0	600	259	0	0	0
Upper Courthouse	123	0	0	1,471	688	0	0	0
Westwater Canyon	265	4,021	0	2,899	780	0	261	0
White Wash	3	0	0	70	0	0	0	0
Wilson Arch	0	0	0	684	817	0	667	0
Total	**6,684**	**27,953**	**23,237**	**190,343**	**212,970**	**582**	**28,231**	**24,370**

Table 4.120. Special Status Species Habitats Included within ACECs for Alternative C

ACEC	SWFL and Yellow-billed Cuckoo	Colorado River Fish	MSO Critical Habitat	MSO Breeding Habitat	MSO Foraging Habitat	Bald Eagle Nesting	Bald Eagle Wintering
Behind the Rocks	118	129	478	1,844	788	0	364
Cottonwood-Diamond Watershed	423	0	0	10,107	22,115	0	0
Highway 279/Shafer Basin/Long Canyon	416	4,529	9,349	6,470	1,923	0	551
Mill Creek Canyon	117	0	0	1,161	3,815	0	0
Ten Mile Wash	382	0	0	600	259	0	0
Total	**1,456**	**4,658**	**9,827**	**20,182**	**28,900**	**0**	**915**

Under Alternative D, none of the thirteen proposed ACEC sites would be established. The management of oil and gas leasing within all ACECs under this alternative would include a mix of Standard, Timing, NSO, and Closed stipulations. Specifically, 43% of the land within the proposed ACEC sites would be managed as Open (Standard or Timing stipulations), while 57% of the land would be Closed (NSO or Closed) to oil and gas production.

Alternative B would encompass the most habitat for Federally listed and special status species within ACECs. Compared to the other alternatives, Alternative B would greatly reduce adverse impacts to special status species and their habitats as it would completely prohibit all disturbances related to oil and gas exploration and production within ACECs, leaving habitats intact and special status species undisturbed. Alternative C would provide more protections than Alternatives D and A, respectively, but less than Alternative B.

4.3.15.12.3 Riparian and Wetland Habitat

The designation of a Wild and Scenic River would beneficially impact special status species that access the habitats directly associated with the river (e.g., SWFL, bald eagle, yellow-billed cuckoo, MSO, and the Colorado River fishes). See Section 4.3.15.10 (Impacts of Riparian Decisions on Special Status Species) for a discussion of the impacts of all alternatives on riparian-associated special status species habitat adjacent to wild and scenic rivers. See the Summary Table of Alternatives (Table 2.1) for detail on which river and stream segments would be considered for designation under each alternative.

Table 4.121 below details the amount of habitat that would be managed as a Wild and Scenic River for the SWFL and yellow-billed cuckoo, bald eagle (nesting and winter), MSO (Critical, Breeding, and Foraging), and the Colorado River fishes. Alternatives A and D would not designate Wild and Scenic Rivers.

Table 4.121. Acres of Federally Listed Species Habitat Managed as Wild and Scenic River, by Alternative

Species	Alternative A	Alternative B	Alternative C	Alternative D
SWFL and Yellow-billed Cuckoo	0	5,668	4,259	0
Colorado River Fish Habitat	0	38,027	34,549	0
Mexican Spotted Owl Critical Habitat	0	0	2,190	0
Mexican Spotted Owl Potential Breeding Habitat	0	28,497	16,374	0
Mexican Spotted Owl Potential Foraging Habitat	0	15,680	5,027	0
Bald Eagle Nesting Habitat	0	468	468	0
Bald Eagle Wintering Habitat	0	5,731	2,748	0

Alternative B would designate the most special status species habitat as WSRs and would therefore provide the most protection for these species, followed by Alternative C. Because Alternatives A and D would not designated Wild and Scenic River segments, they would provide no additional protections for these species. As shown in Table 4.121, Alternative B would manage 94,071 acres of special status species habitat as Wild and Scenic Rivers, versus 65,615 acres under Alternative C, and no WSR designations under Alternatives A and D.

4.3.15.13 Impacts of Special Status Species Decisions on Special Status Species

4.3.15.13.1 Impacts Common to All Alternatives

See Chapter 2 Summary of Alternatives for specific impacts and management common to all alternatives regarding Special Status Species Decisions. There is currently no specific management under Alternative A for the habitats and species addressed below for desert shrub and sagebrush and perennial grassland habitats. The impacts of special status species management decisions for all other special status species and habitats would include those discussed in Section 4.3.15.1 Impacts Common to All Alternatives.

4.3.15.13.2 Desert Shrub and Sagebrush and Perennial Grassland Habitats

Special status species decisions are expected to provide additional protections to species associated with desert shrub and sagebrush and perennial grassland habitats (see Table 4.106 and Section 4.3.15.1). Adherence to the BLM's National Sage-grouse Habitat Conservation Strategy, UDWR and USFWS guidance and the White-Tailed Prairie Dog Conservation Assessment, and other conservation plans identified in Sections 4.3.15.2.7 and 4.3.15.2.8, would reduce adverse impacts to greater and Gunnison sage-grouse and other sensitive sagebrush species in the MPA because of habitat protections and restrictions on human disturbance. These restrictions include surface disturbance and permanent structures and other human activity in or near these species desert shrub, sagebrush and perennial grassland, and oak/mountain shrub habitats.

4.3.15.13.2.1 Greater Sage-Grouse and Gunnison Sage-Grouse

Under Alternative B, 12,850 acres of greater sage-grouse habitat and 246,107 acres of Gunnison sage-grouse habitat would be subject to controlled surface use and timing stipulations. Timing stipulations would preclude surface disturbing activities from March 1 through May 15 within a 2.0 mile radius of an active greater sage-grouse strutting ground, and would apply to occupied nesting and brood-rearing habitat from March 15 through July 15, and occupied winter habitat from November 15 through March 14. For Gunnison sage-grouse, no permanent above-ground facilities would be allowed within a 2.0 mile buffer of year-round occupied habitat, and the construction of fence, powerlines, and tall buildings would be prohibited or limited in year-round occupied habitat (within 6 miles of an active lek). These habitats would be managed to avoid or minimize any surface occupancy that would result in loss or fragmentation of sagebrush habitat. If surface occupancy could not be avoided, sagebrush habitat would be reclaimed at a ratio of 2:1.

Under Alternative C, the impacts of special status species management decisions on special status species and habitat would be the same as those discussed in Alternative B, except for the following: 3,068 acres of greater sage-grouse habitat (9,782 acres or 76% less than Alternative B) would be managed with the same management prescriptions as described under Alternative B; timing restrictions would preclude surface disturbing activities within 0.5 miles from an active strutting ground, thereby reducing the acreage of sagebrush habitat under beneficial timing stipulations when compared to Alternative B. For Gunnison sage-grouse, 175,727 acres of habitat would be managed as described under Alternative B, and timing restrictions would preclude surface disturbing activities within 0.6 miles of an active strutting ground. For both species, if surface occupancy cannot be avoided, sagebrush habitat would be reclaimed at a ratio of 1:1, which is 50% less than Alternative B. Because of these restrictions, there would be less adverse impacts on sensitive plant and wildlife species in sagebrush habitat associated with this alternative than with Alternative A, but more than under Alternative B.

Under Alternative D, 1,986 acres of greater sage-grouse habitat would be subject to surface use and timing stipulations with a 0.25 mile habitat buffer. For Gunnison sage-grouse, 41,620 acres of habitat (204,487 acres or 83% less than Alternative B) would be managed with the same management prescriptions as described under Alternative B. Timing restrictions would preclude surface disturbing activities within 0.25-mile from active Gunnison sage-grouse strutting ground, thereby further reducing the acreage of sagebrush habitats under beneficial timing stipulations when compared to Alternatives B and C. For both species, if surface occupancy cannot be avoided, sagebrush habitat would be reclaimed at a ratio of 1:1, 50% less than Alternative B, but the same as Alternative C. The restrictions under Alternative D would have fewer adverse impacts on greater and Gunnison sage-grouse and other sagebrush associated special status species than under Alternative A, but greater impacts than under Alternatives B and C.

4.3.15.13.2.2 White-tailed Prairie Dog and Gunnison Prairie Dog

Under Alternative B, 199,505 acres of historic white-tailed prairie dog habitat and 10,700 acres of Gunnison prairie dog habitat would be managed to prevent surface-disturbing activities within a 1,300-foot buffer of active colonies. This decision would reduce direct mortality, den destruction, habitat loss, and raptor predation in these colonies. Of this habitat, 117,481 acres would be managed as the Cisco White-tailed Prairie Dog Complex ACEC, which would be subject to an NSO stipulation for oil and gas leasing, which in turn would preclude habitat loss from oil and gas development and other surface-disturbing activities.

Under Alternative C, the impacts of special status species management decisions on special status species and habitat would be the same as those discussed under Alternative B, except for the following: 117,481 acres of White-tailed prairie dog habitat (82,024 acres or 41% less than Alternative B) would be managed with the same management prescriptions described under Alternative B; no ACEC would be established for this species; and a 660-foot buffer around active colonies would be managed for controlled surface use. For the Gunnison prairie dog, a 660-foot buffer around active colonies would be managed for controlled surface use and new powerlines would be avoided. Because these restrictions would mitigate for adverse impact of oil and gas leasing and reduce raptor predation on prairie dogs, there would be fewer adverse

impacts on special status plant and wildlife species in sagebrush habitat under Alternative C than Alternative A, but more adverse impacts than under Alternative B.

Under Alternative D, the impacts of special status species management decisions on special status species and habitat would be the same as those discussed under Alternative B except for the following: 31,186 acres of White-tailed prairie dog habitat (168,319 acres or 84% less than Alternative B) would be managed as described under Alternative B; no ACEC would be established for this species; and a 660-foot buffer around active colonies would be managed for controlled surface use. Under Alternative D, there would be no management actions for Gunnison prairie dogs, which could result in adverse impacts from oil and gas leasing and other surface disturbing activities. Because of these restrictions, there would be fewer adverse impacts on special status plant and wildlife species in white-tailed prairie dog habitat under this alternative than under Alternative A, but greater impacts than under Alternatives B and C. Because there would be no restrictions for Gunnison prairie dogs, this alternative would pose similar impacts as Alternative A, as discussed in Section 4.3.15.1.

4.3.15.13.3 All Other Special Status Species Habitats in the MPA

The impacts of special status species management decisions on all other special status species habitats are discussed in Section 4.3.15.1 Impacts Common to All Alternatives.

4.3.15.14 Impacts of Travel Decisions on Special Status Species

4.3.15.14.1 Impacts Common to All Alternatives

Under all alternatives, any new trail designations would consider special status species habitat through a site-specific NEPA analysis, which could reduce the adverse impacts of surface and noise disturbance on sensitive plant and animal species. Potential impacts from travel management include direct and indirect, short- and long-term impacts on all habitat types from unrestricted, cross-country OHV use within open OHV areas (Table 4.122). Impacts include short-term adverse impacts to air quality from dust production, short- and long-term loss of vegetation cover from vehicle damage and soil disturbance, habitat fragmentation, introduction of invasive and exotic weed species, and associated impacts to habitat quality and quantity.

A number of trails would be managed for non-mechanized travel (see Appendix G for list). Because these trails are already established and in use, there is not likely to be an appreciable increase in disturbance of special status species and habitat resulting from the continued use of these trails. There would also be trails and/or areas open to OHV use under all alternatives. OHV use can physically damage the vegetation in special status species habitat and cause noise disturbance, which could have direct, negative effects on special status species, especially birds, in the MPA (Reijnen and Foppen 1995; Gelbard and Belnap 2003). The surface disturbance associated with OHV use can have direct and indirect adverse effects on individual plants and animals as well as their habitat. These effects are described in Section 4.3.15.9, Impacts of Recreation Decisions on Special Status Species. Table 4.122 below displays the acreage proposed for each travel designation by alternative.

Table 4.122. Acreage of OHV Travel Designation Impacts, by Alternative

Travel Designation	Alternative A	Alternative B	Alternative C	Alternative D
Open	620,212	0	1,866	3,064
Limited to Existing Roads and Trails	1,196,920	0	0	0
Limited to Designated Routes	0	1,475,074	1,481,334	1,762,083
Closed	5,062	347,424	339,298	57,351
Total	**1,822,194**	**1,822,498**	**1,822,498**	**1,822,498**

4.3.15.14.2 ALTERNATIVE A

There are a total of 620,212 acres open to cross-country OHV use under Alternative A, and 1,196,920 acres limited to existing trails and designated routes (including inventoried routes on 309,749 acres within WSAs; see Table 4.122). This is more acreage open to OHV use than under any of the other alternatives. The majority of open OHV areas are in pinyon-juniper and desert shrub habitat types. The large amount of acreage open to cross-country OHV travel could be detrimental to pinyon-juniper woodland and desert shrub associated special status species because of the short and long term adverse effects described above in Impacts Common to All Alternatives (see Table 4.106).

Alternative A designates 5,026 acres as closed to OHV use (2,330 acres of pinyon-juniper woodland habitat, 1,360 acres of desert shrub habitat, and 1,337 acres of sagebrush and perennial grasslands habitat; see Table 4.145 in Section 4.3.19.13, Impacts of Travel Decisions on Wildlife for a breakdown of the closed areas by wildlife species habitat type). These closures would help to mitigate for the adverse effects of this alternative on special status species and their habitat in these protected areas by eliminating surface and noise disturbance associated with OHV use. A list of all areas that would be designated as closed to OHVs under each alternative is located in Table 2.1. Closed areas would include some ACECs and vegetation study areas. For a comparison of OHV closures within selected special status species habitats by alternative, see Table 4.123 below.

Table 4.123. Acreage Within Select Special Status Species Habitats Closed to OHV Use, by Alternative

Habitat Type	Alternative A	Alternative B	Alternative C	Alternative D
SWFL and Yellow-billed Cuckoo	30	3,105	2,450	678
Colorado River Fishes Habitat	7	9,702	7,191	4,477
MSO Critical Habitat	0	1	1	1
MSO Potential Breeding Habitat	515	141,991	140,106	20,340
MSO Potential Foraging Habitat	1,452	171,226	170,731	20,674
Bald Eagle Nesting Habitat	313	327	327	327
Bald Eagle Wintering Habitat	1,767	12,916	10,147	5,822
Jones Cycladenia	0	0	0	0

The total acres closed to OHV use under each alternative in this table should only be used for comparative purposes; the totals do not correlate to the figures given in the text above for total acreages closed to OHV use. The reason for this discrepancy is that the habitat areas of the selected special status species often overlap and therefore some geographic areas are counted more than once in this table.

4.3.15.14.3 ALTERNATIVE B

Under Alternative B, there are a total of 0 acres open to OHV cross-country use. Approximately 1,475,074 acres limit OHV use to designated trails. This is 28% more than under Alternative A.

This alternative has 347,424 acres closed to OHV use, as compared with 5,062 acres closed under Alternative A (see Table 4.145 in Section 4.3.19.13 Impacts of Travel Decisions on Wildlife for a breakdown of the closed areas by wildlife species habitat type). These closures would affect species in all habitat types, and primarily in pinyon-juniper and conifer and mountain shrub habitat (see Table 4.106). See Table 4.123 above for the acreage of special status species habitats closed to OHV use. The effects of this alternative are comparable to the effects of Alternative C. There are fewer acres of native vegetation (special status species habitat) subject to adverse surface-disturbing effects under this alternative than under Alternative D.

4.3.15.14.4 ALTERNATIVE C

Under Alternative C, there are a total of 1,866 acres open to cross-country OHV use under this alternative. This open area is located in desert shrub habitat and would affect those species utilizing that habitat (see Table 4.106). There are 1,481,334 acres where OHV use is limited to designated routes, which is 29% more than under Alternative A.

This alternative has 339,298 acres closed to OHV use, which is approximately 67 times more than under Alternative A. These closures would primarily affect special status species utilizing pinyon-juniper woodland and conifer and mountain shrub habitats (see Table 4.106). Also, see Table 4.145 in Section 4.3.19.13, Impacts of Travel Decisions on Wildlife for a breakdown of the closed areas by wildlife species habitat type. See Table 4.123 above for the acreage of special status species habitats closed to OHV use. The effects of this alternative are comparable to the effects of Alternative B. There are fewer acres of special status species habitat subject to adverse surface-disturbing effects under this alternative than under Alternative D.

4.3.15.14.5 ALTERNATIVE D

Under Alternative D, there are a total of 3,064 acres open to cross-country OHV use, as compared with 620,212 acres open to cross country travel under Alternative A. The majority of this open area is located in desert shrub habitat, and so would affect special status species utilizing that habitat type (see Table 4.106). There are 1,762,083 acres of the MPA with OHV limited to designated trails (including inventoried routes within WSAs). This is 53% more than under Alternative A.

This alternative has 57,351 acres closed to OHV use, as compared to 5,063 acres under Alternative A. These closures would primarily affect special status species utilizing pinyon-juniper and conifer and mountain shrub habitats (see Table 4.106; also see Table 4.145 in Section 4.3.19.13, Impacts of Travel Decisions on Wildlife for a breakdown of the closed areas by wildlife species habitat type). See Table 4.123 above for the acreage of special status species habitats closed to OHV use. The adverse effects of OHV travel on special status species under this alternative would be less than under Alternative A, but more than under Alternatives B or C.

4.3.15.15 Impacts of Vegetation Decisions on Special Status Species

4.3.15.15.1 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, seed gathering and plant collection would be allowed in all areas meeting Utah's Rangeland Health Standards. This could have some short-term, direct, adverse impacts on special status species and their habitat due to trampling and human disturbance during collection activities. However, seed gathering is not widespread and is unlikely to have substantial impacts on special status species.

Control of noxious, invasive and non-native weed species would be implemented through the BLM's weed management policies and action plans. Actions taken to help slow/stop the spread of weeds in the MPA would help reduce the adverse effects of surface disturbance to special status species habitat from grazing, oil and gas development and other surface-disturbing activities.

Tamarisk and Russian olive would be treated in a number of areas to restore riparian areas (see Table 2.1). This could have short-term risk to special status species in the treatment areas, but would have long-term, beneficial effects on the treated, native vegetation community as a whole by removing undesirable, non-native plant species and providing riparian-associated special status species with improved habitat (see Table 4.106 for a list of species). In addition, the removal of noxious weeds and invasive species would benefit native riparian species by removing competition.

Sagebrush habitat would be managed as described in the Sage Grouse Habitat Conservation Strategy (BLM 2004c). Up to 257,809 acres of sagebrush habitat and shrub steppe ecosystems would be reclaimed or restored. These restoration treatments would have long-term, beneficial impacts on special status species in native sagebrush and perennial grasslands communities by providing them with improved habitat.

4.3.15.15.2 Alternative A

Under Alternative A, reclamation would be done on a site-specific basis.

4.3.15.15.3 Alternative B

Under Alternative B, loss of sagebrush steppe habitat deemed essential to wildlife would be reclaimed at a ratio of 2:1. These restoration treatments would have long-term, beneficial effects

on special status species in native sagebrush communities by providing them with expanded and improved habitat.

4.3.15.15.4 Alternatives C and D

Under Alternatives C and D, any loss of sagebrush steppe habitat deemed essential to wildlife would be reclaimed at a ratio of 1:1, half the acres of sagebrush-steppe habitat that would be reclaimed under Alternative B. These restoration treatments would have fewer adverse impacts than Alternative A, and greater impacts to special status species sagebrush habitats than Alternative B.

4.3.15.16 Impacts of Visual Resource Decisions on Special Status Species

4.3.15.16.1 Impacts Common to All Alternatives

All lands in the MPA would be inventoried as one of four visual resource management classes (see VRM Section 3.18 and Table 4.124 below). In areas designated as VRM III or IV, changes to the landscape could be moderate or high. Most types of surface disturbing activities and human visitation would be allowed in VRM III or IV areas. These types of disturbance could have long-term adverse impacts on special status species habitat in the MPA. Under all alternatives, all WSAs would be managed as VRM I.

Table 4.124. Acreages in Each VRM Class, by Alternative

	Alternative A	Alternative B	Alternative C	Alternative D
VRM I	349,110	453,462	358,911	349,617
VRM II	401,015	373,647	365,566	245,773
VRM III	800,782	784,247	829,158	956,724
VRM IV	271,356	210,532	268,133	269,641
Total	**1,822,263**	**1,821,887**	**1,821,768**	**1,821,755**

4.3.15.16.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, Wild and Scenic River segments would be managed as VRM I or II. Limited and very limited management activities would be allowed in areas designated as VRM I or II. All VRM Class I areas would be classified as NSO for oil and gas leasing. A controlled surface use stipulation would be applied to all areas managed as VRM Class II. These limitations on human presence would help mitigate the adverse effects of management activities in special status species habitat.

4.3.15.16.3 Alternative A

Under Alternative A, all lands have been inventoried, but only chosen portions would be managed under VRM classes. Of the four alternatives, this alternative would have the second largest area (750,125 acres) managed for VRM I or II restrictions. It would also have the second

smallest area (1,072,138 acres) managed for VRM III or IV restrictions (see Maps 2-23 A-D for VRM locations). These Class II restrictions would beneficially affect a portion of pinyon-juniper habitat and special status species utilizing it. The Class III restrictions under Alternative A would adversely affect an area of sagebrush and perennial grasslands habitat. See Table 4.106 to relate species with habitat types.

4.3.15.16.4 ALTERNATIVE B

Under Alternative B, some ACECs would also be managed as VRM I or II (see Summary Table of Alternatives, Table 2.1). Of the four alternatives, this alternative would have the largest area (827,093 acres) subject to VRM I and II restrictions. The VRM I and II areas would primarily affect the following habitat types: pinyon-juniper, conifer and mountain shrub, desert shrub, and sagebrush and perennial grasslands. special status species associated with these habitats would gain the greatest benefits for this VRM class management (see Table 4.106). It would have the smallest area (994,780 acres) subject to VRM III and IV restrictions.

4.3.15.16.5 ALTERNATIVE C

Under Alternative C, some ACECs would also be managed as VRM I or II (See Summary of Alternatives, Table 2.1). Of the four alternatives, this alternative would have the second smallest area (714,840 acres) subject to VRM I or II restrictions. These restrictions would affect the same habitat types listed under Alternative A, but would affect sagebrush and perennial grasslands habitat to a lesser degree. It would also have the second largest area (1,106,913 acres) subject to VRM III or IV restrictions.

4.3.15.16.6 ALTERNATIVE D

Under Alternative D, some ACECs would also be managed as VRM I or II (see Summary of Alternatives, Table 2.1). Of the four alternatives, this alternative would have the smallest area (595,390 acres) subject to VRM I or II restrictions. These restrictions would affect the same habitat types described under Alternative B, but would beneficially affect all of them to a lesser degree. It would have the largest area (1,226,365 acres) subject to VRM III or IV restrictions.

4.3.15.17 IMPACTS OF WILDLIFE AND FISHERIES DECISIONS ON SPECIAL STATUS SPECIES

4.3.15.17.1 IMPACTS COMMON TO ALL ALTERNATIVES

Under all alternatives, livestock grazing would not be allowed on 87,285 acres in order to protect wildlife resources. This would primarily take place within the following habitat types: pinyon-juniper woodland, conifer and mountain shrub, and desert shrub (see Table 4.106). The removal of livestock grazing could have long-term beneficial impacts on special status species within these habitats by removing competition for food resources, improving vegetation composition, species diversity and age class, forage availability, vegetative cover, and reducing surface disturbance created by livestock.

In occupied priority migratory bird habitat, no surface disturbance would be allowed from May 1-July 30. Maintenance and/or improvement of lowland riparian, wetlands, and low and high desert shrub communities would be prioritized in the MPA. In addition, bird habitat conservation areas identified in the Coordinated Implementation Plan for Bird Conservation in Utah (Martinsen et al. 2005) would receive priority for conducting bird habitat conservation projects—including offsite habitat compensation—through cooperative funding initiatives such as the Intermountain West Joint Venture. These actions would benefit both migratory bird and special status species by maintaining and improving habitat necessary for survival.

Three Habitat Management Plans would continue to be implemented: the Hatch Point, Potash-Confluence, and Dolores Triangle HMPs. These plans focus on improving upland and riparian habitat for big game species including pronghorn, bighorn sheep, elk and deer, as well as other wildlife species such as chukar partridges and peregrine falcons. Habitat improvements according to these plans would also reduce adverse impacts to special status species that utilize upland and riparian habitat (including sage-grouse, bald eagle, and special status fish species).

4.3.15.17.2 Impacts Common to All Action Alternatives (B, C and D)

Under all Action Alternatives, the reintroduction of native and naturalized fish and wildlife species into historic or suitable ranges would be considered where it is determined to be appropriate. If the species to be reintroduced is a special status species, (e.g., any of the four Colorado River endangered fishes), that species would experience a direct, long-term benefit from the action. Even in situations where the species to be reintroduced is not a special status species, this action could help to reestablish special status species by encouraging a more balanced ecosystem dynamic within the habitats of the MPA.

Special status species that rely on riparian habitat for reproduction and survival (e.g., southwestern willow flycatcher, bald eagle, and yellow-billed cuckoo) would benefit from two decisions involving riparian areas. Dispersed camping would be restricted (limited to designated sites or prohibited, depending on the area) to protect riparian wildlife habitat. In addition, riparian areas would be managed for multi-aged, multi-layered vertical structure, allowing for the retention of snags and diseased trees. These actions would improve habitat quality for special status species that utilize riparian habitat because of the reduction in human trampling and noise and because of the improvement of habitat diversity and quality.

Raptors would be managed under the auspices of the Best Management Practices (see Appendix O), including spatial and seasonal buffers, to ensure the protection of nests. These BMPs would directly benefit those raptors that are considered special status species, including the MSO, burrowing owl, bald eagle, golden eagle, and ferruginous hawk.

An additional 3,263 acres of livestock grazing allotments (aside from those listed under Impacts Common to All Alternatives) would be removed in order to benefit wildlife resources. The removal of livestock grazing could reduce adverse impacts to special status species by reallocating forage in these areas from livestock to wildlife use.

Fire suppression would be limited within the MPA and prescribed burns would be initiated in order to increase native vegetation productivity and forage for wildlife. Special status species that depend on habitat with new growth or relatively open ground (e.g., prairie dog and burrowing owl) may be adversely affected in the short term, but would experience long-term benefits from this action because of long-term habitat quality improvement.

4.3.15.17.3 ALTERNATIVE A

Under Alternative A, pronghorn fawning would be seasonally protected from development between May 15 and June 20. Approximately 42,500 acres of desert bighorn sheep habitat would be improved by preventing major human disturbance during breeding and lambing seasons. Approximately 194,560 acres of land would be designated and managed as Rocky Mountain bighorn sheep habitat. Seasonal protection would also apply on 260,769 acres of deer and elk winter range; exploration, drilling, and other development activity would be allowed only from May 16 through October 31. These restrictions would also protect special status wildlife species in these areas by mitigating for the adverse effects of surface disturbance related to minerals development (see Section 4.3.15.2.6).

Table 4.25, below, displays the total acreage of all wildlife timing limitations for each vegetation type by alternative. Total acreage includes deer and elk winter habitat; pronghorn fawning habitat; desert bighorn lambing, rutting, and migration habitat; and Rocky Mountain bighorn occupied habitat. Although these restrictions apply to big game habitats, special status species utilizing the habitat would benefit from surface disturbance restrictions. Tables S.1 through S.4 (4 tables) in Appendix S itemizes the acreage for each habitat type. See Table 4.106 to relate vegetation (habitat) types to special status species. Note that overlap occurs among species habitat and therefore acreage totals for each alternative may be more than the actual acreage represented on the ground.

Table 4.125. Acreage of All Wildlife Timing Restrictions for Vegetation Types by Alternative

Vegetation Type	Alternative A	Alternative B	Alternative C	Alternative D
Conifer/Mountain shrub	29,108	95,778	50,281	23,836
Desert shrub	20,585	757,208	312,877	285,004
Invasive species and weeds	818	21,950	15,222	15,024
Pinyon-juniper Woodland	188,574	979,393	553,653	449,148
Riparian/Wetland	1,594	11,746	6,609	4,588
Sagebrush/Perennial grassland	16,549	138,867	102,413	98,225

Alternative A would have the least amount of wildlife habitat subject to special wildlife conditions (257,228 acres). Details on these conditions are found in the wildlife section and under Alternative B, below. Because timing limitations generally reduce adverse impacts to special status species utilizing big game habitat areas, Alternative A would provide the fewest beneficial restrictions.

4.3.15.17.4 ALTERNATIVE B

Under Alternative B, a total of 2,004,942 acres would be subject to timing and surface use stipulations to prevent disturbance and habitat impacts to pronghorn, Rocky Mountain bighorn sheep, deer, and elk. In addition to benefiting big game species, these restrictions would also protect special status wildlife and plant species in pinyon-juniper woodland, desert shrub, and sagebrush and perennial grasslands habitats (see Tables 4.106 and 4.125). Maintenance and operation activities for mineral production as well as hunting would be allowed during seasonal restrictions. Therefore, these restrictions would offer only minor mitigation potential for the adverse effects of surface disturbing activities on wildlife species and their habitats. Because timing limitations generally reduce adverse impacts to special status species utilizing big game habitat areas, Alternative B would provide the most beneficial restrictions for these species.

4.3.15.17.5 ALTERNATIVE C

Under Alternative C, 1,041,055 acres of wildlife habitat would be subject to timing or surface use restrictions. This would reduce impacts over a larger area of pinyon-juniper woodland, desert shrub, and sagebrush and perennial grasslands habitats (see Table 4.106) than Alternatives A or D, and a smaller area than Alternative B. This alternative would provide more habitat use restrictions benefiting special status species than Alternatives A or D, but fewer restrictions than Alternative B.

4.3.15.17.6 ALTERNATIVE D

Under Alternative D, 875,825 acres of wildlife habitat would be subject to timing or surface use restrictions. This would benefit special status species in pinyon-juniper, desert shrub, and sagebrush and perennial grassland habitats (see Tables 4.106 and 4.125). Accordingly, Alternative D would provide more beneficial impacts for these species than Alternative A, but less than Alternatives B and C.

4.3.15.18 IMPACTS OF WOODLANDS DECISIONS ON SPECIAL STATUS SPECIES

4.3.15.18.1 IMPACTS COMMON TO ALL ALTERNATIVES

Impacts to special status species from woodland management activities include removal of trees used by these species as cover, roosting or breeding sites, direct impacts to individuals from trampling or crushing during harvesting, and indirect negative impacts due to changes in vegetation structure. Woodland harvest resulting in reduced probability of catastrophic wildfire would likely reduce potentially adverse impacts to special status species that occupy woodland habitats.

Indirect, adverse effects of wood gathering include trampling and removal of native vegetation, which result in special status species habitat degradation that can include reductions in prey species, forage species, and cover. Table 4.133 in Section 4.3.17.16, Impacts of Woodlands Decisions on Vegetation Resources, presents the number of acres of each vegetation type closed to woodland harvest as presented for each alternative for the MPA.

Sensitive wildlife species in pinyon-juniper woodland habitat would face short- and long-term, adverse impacts from surface and noise disturbance associated with woodland harvest.

4.3.15.18.2 ALTERNATIVE A

Under this alternative, 1,243,743 acres of pinyon-juniper woodland habitat would be open to woodland harvest and wood gathering. Of the four alternatives, this alternative would have the largest area open to woodland harvest and wood gathering, and therefore the greatest potential risk of disturbance to special status species utilizing this habitat (see Table 4.106).

4.3.15.18.3 ALTERNATIVE B

Under Alternative B, 1,071,335 acres of pinyon-juniper woodland habitat would be open to woodland product harvest. Of the four alternatives, this alternative would have the lowest number of acres open to woodland harvest and wood gathering and, therefore, the lowest risk of disturbance for special status species utilizing this habitat.

4.3.15.18.4 ALTERNATIVE C

Under Alternative C, 1,212,886 acres of pinyon-juniper woodland habitat would be open to woodland product harvest. This alternative would have fewer potentially adverse impacts on special status species in this habitat than Alternatives A or D, but more than Alternative B.

4.3.15.18.5 ALTERNATIVE D

The impacts of woodlands decisions on special status species under Alternative D are identical to those described for Alternative A.

4.3.15.19 SUMMARY OF IMPACTS

Table 2.2 of Chapter 2 summarizes the impacts of the various alternatives and their program actions on special status species.

4.3.16 TRAVEL MANAGEMENT

This section discusses impacts to travel from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning travel management are described in Chapter 3.

Travel management would affect a variety of travel modes as discussed in Section 3.16.1. OHV (motorized vehicle) travel would be managed under four possible categories, based on BLM land use planning decisions on route utility, and on decisions to protect natural resources and maintain public safety. The OHV categories are: 1) Open to unlimited, cross-country travel, 2) Limited to Inventoried or Existing routes (under Alternative A only), 3) Limited to Designated Routes, or 4) Closed to OHV use.

The analysis of impacts to travel within the MPA was conducted under two assumptions. First, travel routes designated as available to OHV use would allow all forms of travel (i.e., motorized, mountain biking, and non-mechanized hiking and equestrian), which would have beneficial impacts to travel by providing opportunities for a wide range of travel modes. Second, routes not designated would adversely affect travel because of the reduced opportunities for mechanized and motorized access to areas within the MPA. The indicators for analyzing impacts to travel are: 1) miles of route (see below) designated or not designated for OHV use, and 2) the number of acres designated as open or closed to OHV access.

Utah State road classes were considered in the impacts analysis. The road classification relevant to the analysis was the Utah Department of Transportation Class-D roads. These are unpaved roads, and not regularly maintained nor funded for maintenance by the state. Most of the routes within the MPA are in this road class (see Travel Plan, Appendix G). Utah Class-B roads are also proposed as designated routes under the Travel Management prescriptions (see Chapter 2 Summary Table of Alternatives); however, these routes were not used as analysis criteria because they are maintained San Juan County and Grand County roads that currently provide motorized access throughout the MPA and whose travel function or designation would not change under any of the proposed alternatives.

4.3.16.1 Impacts Common to All Action Alternatives (B, C and D)

After approval of the RMP, if the MFO Authorizing Officer determines that OHV travel use would cause or have the potential to cause adverse impacts, then an area could be closed to travel or travel restrictions would be imposed. This would potentially have long-term, adverse impacts on travel because opportunities would be reduced.

Once Travel Plan routes are established in the RMP, (see Appendix G for a description of the route planning process) designated routes could be modified or adjusted at the implementation and project-planning level. The route adjustments would be done through a collaborative process involving local governments and the public. The impacts to travel management would be beneficial in the long-term because potential travel-related resource use conflicts would be identified and satisfactorily resolved since the route modification process would include interested and/or concerned stakeholders.

4.3.16.2 Alternatives Impacts

Management decisions from the following resources would have negligible impacts on travel management and will not be analyzed further in this section: Fire Management, Health and Human Safety, Lands and Realty, Livestock Grazing, Paleontology, Recreation, Riparian, Soils/ Watershed, Special Status Species, Visual Resources, Wildlife and Fisheries, and Woodlands. The impacts would be negligible because reducing the risks of wildland fire; protecting public safety around AML sites and reducing the risks of hazardous materials spills; designating ROWs, lands acquisition, exchange, or sales; establishing livestock utilization levels and applying rangeland grazing standards and guidelines; managing recreational areas and user groups; protecting riparian areas, sensitive soils, water resources; protecting federally listed species and

other non-listed wildlife and fish species; protecting scenic quality; and permitting woodland harvesting would not change designated travel routes and OHV travel within the MPA.

4.3.16.2.1 Impacts of Air Quality Management Decisions on Travel

Air quality management common to all of the alternatives would require compliance with Utah air conservation regulations that prohibit the use, maintenance, or construction of roads without fugitive dust abatement measures. BLM policy requires monitoring and managing exhaust emissions and fugitive dust to prevent deterioration of air quality within potentially affected national park Class I airsheds (for the MFO, this would include the adjacent Canyonlands and Arches National Parks). The impacts on travel would be minor and short-term along unpaved travel routes (i.e., Class-D roads, single-track routes, mechanized trails) that require road surfacing-related dust abatement measures because travelers could experience some travel delays or re-routing around the affected road sections during dust abatement and maintenance projects.

4.3.16.2.2 Impacts of Cultural Resource Decisions on Travel

4.3.16.2.2.1 Alternative A

Under Alternative A, there are no specific prescriptions that address travel opportunities or potential restrictions on travel within the context of cultural resources management.

4.3.16.2.2.2 Alternatives B–D

Under all of the action alternatives (B, C, and D), cultural sites could be closed to visitation if it were determined that travel-related activity threatens cultural site integrity. If sites were closed, then travel opportunities could be adversely affected in the short-term or long-term, depending on MFO decisions to protect a threatened site. Compared to Alternative A, the action alternatives would potentially have more long-term, adverse impacts on travel opportunities because access would be reduced to protect cultural resources.

4.3.16.2.3 Impacts of Minerals Decisions on Travel

Minerals-related access roads would be constructed under all of the alternatives and would be generally available for use by the public, but the RFD-predicted level of mineral resource development would result in a relatively small number of additional access roads (i.e., spur roads to drilling sites) when compared to the existing or designated routes within the MPA. Minerals decisions that permit oil and gas exploration and development would have beneficial, but minor, impacts on travel access and opportunities because minerals-related access roads would increase opportunities.

4.3.16.2.4 Impacts of Non-WSA Lands with Wilderness Characteristics Management Decisions on Travel

4.3.16.2.4.1 Alternatives A and D

No lands would be managed for wilderness characteristics under Alternatives A and D; there would be no impacts to travel management from these decisions.

4.3.16.2.4.2 Alternative B

Under Alternative B, over 177 miles of route within 26 non-WSA lands with wilderness characteristics would not be designated for motorized travel (compared to 294 miles in Alternative A). An additional 7 non-WSA lands with wilderness characteristics would have no routes would designated for travel (Arches Adjacent, Big Triangle, Dome Plateau, Floy Canyon, Horsethief Point, Mexico Point, Yellow Bird.) This would adversely impact those recreationists engaging in motorized activities by removing 177 miles of available route. However, this would provide a beneficial impact to those recreationists seeking a more primitive experience. Development of routes for mechanized travel would not be permitted on the 266,485 acres of non-WSA lands managed for wilderness characteristics.

4.3.16.2.4.3 Alternative C

Travel in Beaver Creek would be limited to 12.45 miles of designated route (reducing route miles by 6.3 miles in Alternative A); travel in Fisher Towers would be limited to 4.3 miles of designated route (reducing route miles of 6.68 miles in Alternative A); travel in Mary Jane Canyon would be limited to 10.04 miles of designated route (reducing route miles by 23.28 miles in Alternative A). This would adversely impact those recreationists engaging in motorized activities by removing 36.26 miles of available route. However, this would provide a beneficial impact to those recreationists seeking a more primitive experience. Development of routes for mechanized travel would not be permitted on the 47,761 acres of non-WSA lands managed for wilderness characteristics.

4.3.16.2.5 Impacts of Special Designations Decisions on Travel

4.3.16.2.5.1 ACECs and Wild and Scenic River Segments

Under all alternatives, OHV, mountain biking, and non-mechanized recreational travel and access opportunities within river segments being considered for WSR status, and travel within ACECs would be limited to routes either designated under prescriptions to protect resource values in these areas or under the Moab Travel Plan (see Section 4.3.16.2.6).

This would have negligible to minor impacts on travel opportunities because travel routes into these areas would be allowed under all alternatives. However, no areas would be designated as open to unlimited, cross-country OHV travel within special designations, which would have long-term, adverse impacts on this form of travel because cross-country travel opportunities within these areas would be prohibited.

4.3.16.2.5.2 WSAs and Wilderness Areas

Alternative A

Wilderness area and WSA prescriptions under Alternative A would continue to designate 12,635 acres in the Behind the Rocks WSA as Closed to OHV access, and travel limited to inventoried routes on 82.5 miles of way within 309,749 acres of Wilderness and WSAs. The impacts to travel opportunities would continue to be adverse in the long-term within the Behind the Rocks WSA because OHV access and travel opportunities would not be available in this area.

Alternative B

Alternative B prescriptions would manage all WSAs and the Black Ridge Wilderness (a total of 354,015 acres) as closed to OHV travel, which would have long-term, adverse impacts on travel opportunities within these special designation areas. No routes would be designated. The impacts to travel would be more adverse under this alternative, when compared to Alternative A, because more area would be closed to OHV travel.

Alternative C

Under Alternative C, 344,056 acres of WSA and Wilderness would be closed to OHV travel, with 9,959 acres managed for OHV travel limited to designated routes (with 3.1 miles of route designated). The impacts to travel would be similar to Alternative B because only 3% of all WSA and Wilderness areas would be managed for OHV travel and access opportunities. Compared to Alternative A, this alternative would be similar to Alternative B because the total WSA area closed to travel opportunities would be similar.

Alternative D

Under Alternative D, motorized travel in all WSA and Wilderness areas would be designated as limited to designated routes (with 16 miles of route designated), with long-term, beneficial impacts on travel opportunities and access into these areas, since motorized opportunities will be available on these 16 miles of route. The impacts on travel would less beneficial to travel than Alternative A because although travel opportunities would be available in all WSA and Wilderness areas in Alternative D, there would be fewer miles of route available for use.

4.3.16.2.6 Impacts of Travel Management Decisions on Travel

4.3.16.2.6.1 Motorized (OHV) Travel

Alternative A

Under Alternative A, OHV travel would be managed under open, limited, and closed designations, as shown below in Table 4.126, with travel prescriptions as approved under the current RMP and subsequently modified by Federal Register limitations and restrictions issued after approval of the RMP. Alternative A would manage 620,212 acres as open for cross-country travel, 1,196,920 acres as limited to existing, inventoried and/or designated routes, and 5,062 acres as closed to OHV travel. Designation of 620,212 acres of the MPA as open to OHV areas

would have negligible impacts on travel opportunities because opportunities would be unrestricted for all modes of travel. Limited OHV use along inventoried and/or designated routes would also have negligible impacts on OHV travel because travel along these routes would remain unimpeded. The adverse impacts on OHV travel would be minor, in the long-term because, approximately 99% of the MPA would be accessible either by cross-country travel or along designated and inventoried/existing routes.

Table 4.126. OHV Designations by Alternative

Travel Designation	Alternative A (Acres)	Alternative B	Alternative C	Alternative D
Open	620,212	0	1,866	3,064
Limited to Existing Roads and Trails	1,196,920[4]			
Limited to Designated Routes		1,475,074	1,481,334	1,762,083
Closed	5,062	347,424	339,298	57,351
Total[1]	**1,822,194**	**1,822,498**	**1,822,498**	**1,822,498**
D routes (miles)	4,673	2,144	2,519	2,671
Designated Motorcycle Routes (miles)	0[3]	0	123	219

[1]Acreage figures may vary by alternative due to the changes in GIS technology and variances in GIS shapefiles.

[2]These are the miles of designated routes at time of EIS publication. After the issuing of the ROD, minor adjustments may be made by the MFO to more accurately define the designated routes.

[3]The Slickrock Trail, while open to motorcycle use, was not designated as a motorcycle route under the current RMP.

[4] 48,169 acres would be limited to designated roads and trails; and 309,749 acres would be limited to inventoried routes in WSAs.

Alternative B

This alternative would designate no area as open to cross-country OHV travel. Limited OHV travel would be permitted on 1,475,074 acres of designated routes, with 347,424 acres closed to all OHV travel. These travel designations would allow opportunities on approximately 81% of the MPA, which would have adverse, long-term, but minor, impacts on travel opportunities because a small proportion (19%) of the MPA would not be available for travel access. Compared to Alternative A, this alternative would manage the MPA with more long-term, adverse, restriction-related impacts on OHV travel, as 342,362 more acres would be subject to long-term prohibitions on OHV access under the closed designation.

Alternative C

Alternative C would have impacts similar to those discussed under Alternative B because the acreages designated as limited and closed to OHV use are similar, except that a small area (1,866 acres) would be designated as open to OHV travel within the White Wash Sand Dunes and managed as a motorized OHV focus area (see Recreation Section 4.3.10.2.10.6). Compared to Alternative A, Alternative C would have impacts similar to those discussed under Alternative B because the acreage comparisons are similar: approximately the same number of acres would be closed to OHV cross-country travel.

Alternative D

Under Alternative D OHV travel prescriptions, 57,351 acres would be closed, 1,762,083 acres would be designated as limited to designated routes, and 3,064 acres would be open to cross-country OHV travel within two motorized OHV focus areas (White Wash Sand Dunes and Airport Hills). Approximately 97% of the MPA would be available for travel opportunities and access. The impacts would be similar to those discussed under Alternative A, but to a lesser degree, because, although a large proportion of the MPA would be open to travel, the access would be along designated routes and not cross-country.

4.3.16.2.6.2 D-Class Road Travel

Note that the miles of D-Class routes are included within acreages of OHV travel discussed previously. Class B roads are available for travel under all alternatives.

Alternative A

Under Alternative A, 4,673 miles of D-class route would be available for travel (as either inventoried, existing or designated routes). No miles would be specifically designated for single-track, motorized travel (i.e., motorcycle OHV travel). As shown above in Table 4.126, motorcycle use is currently allowed on the Slickrock Trail, but formal motorcycle trail-use designation was not included in the 1985 RMP. Under this alternative, the opportunities for travel along D-Class routes would be unimpeded, with long-term, beneficial impacts to travel.

Alternative B

Alternative B would designate approximately 2,144 miles of D-Class routes, with no miles designated for single-track, motorized use. Under this alternative, travel opportunities would be adversely reduced in the long-term because 2,144 miles of inventoried routes would not be designated due to lack of an identifiable purpose and need, and 655 miles would not be designated because of resource use conflicts (cultural, wildlife, sensitive soils, recreation, riparian, wilderness values, and floodplains). See Appendix G for a discussion of the collaborative BLM/County route designation process. Compared to Alternative A, this alternative would have greater adverse impacts on travel opportunities because the proposed Travel Plan would eliminate 2,529 miles of routes within the MPA that would otherwise be available for travel.

Alternative C

This alternative would propose approximately 2,519 miles of D-Class routes, and would designate 282 miles of motorcycle single-track routes. The impacts on travel would be similar to Alternative B and for the same reasons, except that the designated single-track routes would provide long-term, beneficial recreation-related travel opportunities for the off-highway motorcycle user group (see Recreation 4.3.10 for user group descriptions). When compared to Alternative A, Alternative C would be similar to Alternative B because the miles of routes not designated (and the reduction in travel opportunities) would be similar: approximately 2,154 miles of routes would not be designated, resulting in long-term, adverse impacts on MPA travel opportunities.

Alternative D

This alternative would propose approximately 2,671 miles of D-Class routes and 340 miles as designated motorcycle single-track routes. When compared to Alternative A, the adverse impacts to travel would be similar to Alternative B, but to a lesser degree, because the miles of route closures would be similar. Approximately 2,002 miles of routes would not be designated, resulting in impacts similar to those identified in Alternative B.

4.3.16.2.6.3 Mountain Biking Recreational Travel

Under management common to all action alternatives, mountain biking travel opportunities would be allowed on all routes open to motorized travel use, and management would be applied to these routes to identify and modify routes, as needed, to meet mountain biking travel needs. Approximately 11 miles of existing single-track routes would be managed for mountain biking use only. These prescriptions would have long-term, beneficial impacts on mountain biking travel by expanding recreational travel and access opportunities for this user group.

Alternative A

Under Alternative A, the impacts of management on mountain biking travel would be adverse in the long-term because none of the prescriptions would specifically or adequately address the current trends of increasing resource-user conflicts between motorized OHV and mountain biking travelers and mountain biking user displacement by motorized OHV users. Under this alternative, mountain biking travel conditions would be degraded in the long term, and recreational travel opportunities and experiences would likely be diminished for the aforementioned reasons.

Alternatives B–D

Proposed management under the action alternatives would have long-term, beneficial impacts on mountain biking travelers by developing additional mountain biking routes: 75 miles under Alternative B, 150 miles under Alternative C, and 300 miles under Alternative D. These routes would include proposed additional support facilities (e.g., trailheads, signs, and route markers). The beneficial impacts would vary by degree, with Alternatives C and D having the most beneficial impacts on mountain biking travel. Compared to Alternative A, all of the action alternatives would be more beneficial to mountain biking travel because 1) travel user conflicts and displacement would be addressed by converting inventoried routes not designated for motorized OHV use to mountain biking travel; and 2) the demand for mountain biking travel facilities would be addressed by installing additional facilities.

4.3.16.2.6.4 Non-mechanized Recreational (Hiking, Backpacking, Equestrian) Travel

Management common to all action alternatives would provide non-mechanized travel opportunities on all routes open to motorized OHV and mountain biking users. Non-mechanized travel opportunities would be unrestricted within the MPA, except where limited or restricted to protect specific resources values. Seventeen miles of non-mechanized routes on existing trails

would be managed for non-mechanized users. Equestrian users would be encouraged to participate with the MFO in identifying additional non-mechanized trails for development of equestrian and hiking routes. These actions would have long-term, beneficial impacts on non-mechanized travelers by expanding the travel opportunities for this user group and by reducing user-conflicts with motorized and mountain bike travelers.

Alternative A

Under this alternative, equestrian use would continue to be discouraged in Negro Bill Canyon in order to protect canyon resources, but would have negligible impacts on non-mechanized travel as the canyon route would still be open to foot travel. Commercial equestrian use would not be allowed in Mill Creek Canyon, but private use would continue. In general, the prescriptions under Alternative A would have long-term, adverse impacts on non-mechanized travel because the alternative does not address current trends within the MPA, including: 1) the increase in resource user conflicts between non-mechanized and mountain biking travelers; 2) the increasing displacement of non-mechanized travelers from areas used by motorized OHV users and mountain bikers (see Section 3.10.2.6); and 3) the demand for recreational facilities to meet traveler needs, such as trailhead signs, route markers, and information kiosks (see Section 3.10.2.5).

Alternatives B–D

The specific prescriptions under these alternatives would be beneficial in the long-term to non-mechanized travel because resource-use conflicts between non-mechanized and mechanized (including OHV and mountain bike) users would be addressed by developing exclusively non-mechanized travel routes. Support facilities would be installed along existing and new trails, and specified existing trails would be managed for equestrian use (with hiking allowed). The difference in impacts between the alternatives varies by degrees: Alternatives B, C, and D would develop up to 25, 50, and 100 miles of additional routes and appropriate support facilities, respectively. Compared to Alternative A, all of the action alternatives would have more beneficial impacts on travel by providing more opportunities and more facilities for non-mechanized travel.

4.3.16.2.7 Impacts of Vegetation Decisions on Travel

4.3.16.2.7.1 Alternative A

Under this alternative, there would be no impacts from vegetation-related prescribed fire/fuel reduction or invasive/non-native plant control projects on travel opportunities or access because no drought management prescriptions on travel would be in place.

4.3.16.2.7.2 Alternatives B–D

For all of the action alternatives, prescriptions for managing drought conditions under the proposed adaptive drought management plan could adversely restrict travel or reduce travel opportunities in the short-term by closing areas to public entry. This would potentially have more adverse impacts on travel than Alternative A because closing areas to public entry under the

drought plan would restrict travel opportunities; however, these impacts would be minor because they would likely be short-term and would only be imposed under exceptional conditions.

4.3.16.3 Summary of Impacts

Table 2.2 of Chapter 2 summarizes the impacts of the various alternatives and their program actions on travel management.

4.3.17 Vegetation

This section discusses impacts to vegetation from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning vegetation are described in Chapter 3.

Vegetation types for the MPA were categorized as conifer/mountain shrub, desert shrub, pinyon-juniper, riparian and wetlands, and sagebrush/perennial grass communities.

For the purposes of this RMP, the primary indicator of impacts to vegetation is the acres of surface disturbance caused by management decisions regarding other resources. Such surface disturbance would impact vegetation resources to varying degrees, depending on the amount, location, and type of surface disturbance and the disturbed vegetation's characteristics or ability to withstand surface disturbance. Surface-disturbing activities that currently occur and that are expected to continue include grazing; minerals development; recreation and OHV use; woodland harvest; and vegetation treatments.

The following resource management decisions would have negligible impacts to vegetation and, therefore, are not discussed further: air quality, cultural resources, human health and safety, paleontological resources, and visual resources. The impacts would be negligible because protecting air quality, protecting and inventorying cultural resources, maintaining public safety around AML sites and reducing the risks of hazardous materials spills and site cleanup, allowing scientific study of and recreational collection of fossils, and protecting scenic quality under designated VRM Class objectives would neither improve nor degrade vegetation resources within the MPA.

4.3.17.1 Impacts Common to All Alternatives

Weed management in the MPA would include control of existing noxious weed species and preventing the spread of invasive species. Restoration and rehabilitation activities would always use certified weed-free mulch and seed mixes; native seed mixes would be used whenever possible. Additionally, users with stock animals would be required to provide certified weed-free feed for stock animals. These actions would benefit vegetation resources by reducing the spread of noxious weeds.

4.3.17.2 Impacts Common to All Action Alternatives (B, C and D)

In accordance with the BLM sagebrush conservation guidance, the MPA would reclaim and restore up to 257,809 acres of sagebrush habitat and shrub-steppe ecosystems. Efforts would include prioritizing sagebrush-steppe communities for wildfire suppression, emergency stabilization and fuels reduction, and following the BLM's Sage-Grouse Conservation Strategy. The Sage-Grouse Conservation Strategy would be used, when applicable, in the development and implementation of vegetation and land treatments, livestock manipulation techniques, fire projects, energy exploration and development, and any surface-disturbing activity within sagebrush and shrub-steppe communities. All of these actions would have beneficial, protection- and enhancement-related impacts on native plant species from vegetation restoration and reclamation, and from the reduction of invasive species establishment.

Vegetation treatments, including biological, chemical, mechanical, and prescribed burns, would be used to reduce tamarisk and Russian olive where appropriate. In addition, the MPA would incorporate vegetation treatments from the Utah Record of Decision (ROD) for Vegetation Treatment on BLM Lands in Thirteen Western States EIS (BLM 1991a as amended). Management would also include restoration of riparian habitat to native willow and cottonwood communities, including replanting cottonwoods and willow subsequent to wildland fire or other disturbance in riparian areas, where appropriate. The impacts of the above-mentioned treatments and restoration activities on vegetation resources would be adverse, short-term, and minor due to vegetation removal and/or trampling; however, the treatments and restoration actions would reduce native species competition with noxious weeds and invasive plant species, which would have long-term, beneficial impacts on vegetation resources.

Under decisions common to the action alternatives, the MPA would establish criteria for restricting activities during drought, through an adaptive drought management program. These restrictions could result in beneficial, short-term and long-term impacts on vegetation because criteria would be established and BMPs applied to restrict or prohibit surface impacts to vegetation. These actions would result in beneficial impacts to vegetation from such actions as suspending or limiting seed collecting, suspending surface-disturbing activities, changing livestock use, and limiting prescribed burn and vegetation treatments during periods of drought. For more detail on adaptive drought management, refer to Chapter 2 Vegetation Management Common to All Action Alternatives.

4.3.17.3 Impacts of Fire Management Decisions on Vegetation Resources

Under all alternatives, the Utah Land Use Plan Amendment for Fire and Fuels Management would be implemented in fire-related actions (BLM 2005c). As discussed in Section 4.3.3 Fire Management, the MFO would treat 5,000 to 10,000 acres annually (approximately 0.5% of the MPA), depending on budgetary and time constraints. The majority of these treatments would likely be concentrated in pinyon-juniper vegetation. Wildland fire use would not be authorized in areas that are known to be highly susceptible to post-fire cheatgrass or other weed invasion, areas with important terrestrial and aquatic habitats, and non-fire adapted vegetation communities unless reasonable resource protection measures were in place. These actions would have long-term, beneficial impacts on vegetation by reducing the opportunities for the spread of weeds and exotic, invasive species into native vegetation communities.

Fuels management actions such as mechanical and manual treatments, prescribed fire, chemical or biological vegetation control, and aerial/ground seeding would have both beneficial and adverse impacts on vegetation communities in fire-treated areas. Long-term, beneficial impacts to vegetation would occur in treated areas once invasive species competition was eliminated or reduced, assuming that a diverse native community has the potential to establish itself in the area. The short-term, adverse impacts of fuels management actions on vegetation would include the unavoidable potential trampling and disturbance of rare native species, and the thinning and removal of ecologically desirable species. These actions could result in a short-term, adverse reduction of native species diversity. However, these treatments would improve vegetation communities in the long term once native or desirable non-native vegetation were reestablished. These beneficial impacts would include more varied species and habitat structure, multiple age classes, and openings for forbs and woody species recruitment.

4.3.17.4 Impacts of Lands and Realty Decisions on Vegetation Resources

Lands and Realty decisions that have the potential to have adverse impacts on vegetation would result from authorizations of right-of-way (ROW) grants and the expansion or development of utility corridors. These actions would create surface disturbances of various magnitudes depending on the size and location of the project. Impacts from minerals ROWs such as access roads and pipelines are accounted for in the minerals surface disturbance calculations (see Section 4.3.17.6). Surface impacts from construction of communication facilities and wind and solar energy development would be disclosed in site-specific NEPA documentation. There would also be potential for the introduction of noxious or invasive plant species via construction equipment, vehicles, and personnel. However, the adverse impacts would be mitigated through BMPs, noxious weed controls, and restoration and rehabilitation measures outlined in Management Common to All. As an example, under Management Common to All for Lands and Realty the existing utility corridor from Cisco to US Highway 191 would be eliminated and restored.

Beneficial impacts would result from identification of exclusion and avoidance areas for ROWs and mineral withdrawals. Because withdrawals are generally for mineral entry, they are discussed in Minerals, Section 4.3.17.6. Exclusion areas would offer greater protections for vegetation than avoidance areas because they would completely preclude surface-disturbing activities. Exclusion and avoidance areas would include any areas proposed as Closed (exclusion) NSO (avoidance) due to lands being managed for wilderness characteristics, ACECs, WSAs, Wilderness Areas, or Threatened and Endangered species habitat.

Under Alternatives A and D, potential vegetation-related surface disturbances within the proposed I-70 utility corridor would be up to 1-mile wide. Under Alternative C, they would be up to a 0.5-mile wide and under Alternative B, they would be up to 100-foot-wide. The following Table 4.127 shows the acres of vegetation within each vegetation type under each alternative that would be potentially impacted by surface disturbances in the proposed utility corridors. Alternative A would have the least area of vegetation potentially impacted by the proposed utility corridors, followed by Alternatives B, C, and D, respectively. Compared to Alternative A, all of the action alternatives would have potentially more adverse impacts on vegetation by expanding the width of MPA utility corridors.

Table 4.127. Acreage of Vegetation Types Potentially Impacted in Utility Corridors, by Alternative

Vegetation type	Alternative A	Alternative B	Alternative C	Alternative D
Conifer/mountain shrub	9	0	19	19
Desert shrub	25,144	52,053	113,917	141,797
Invasive species and weeds	308	1,327	2,084	2,492
Pinyon-juniper	5,345	8,808	41,672	44,189
Riparian/wetland	143	323	1,031	1,139
Sagebrush/ perennial grass	1,551	3,355	14,376	14,531
Total	**32,500**	**65,866**	**173,099**	**204,167**

All alternatives would manage WSAs, and Wilderness Areas as exclusion areas, and all alternatives would manage ACECs as avoidance areas. Alternative B would manage non-WSA lands with wilderness characteristics as exclusion areas and Alternative C would manage them as avoidance areas. All action alternatives (B, C, D) would manage areas with NSO stipulations as avoidance areas. Since Alternative B would manage 266,485 acres of lands with wilderness characteristics as exclusion areas, this alternative would offer the greatest protection to vegetation of all the alternatives. Alternative C would manage for five ACECs totaling 63,758 acres and three areas with wilderness characteristics totaling 47,761 acres. As a result, Alternative C would provide for the second largest area of protection but only as avoidance areas. Thus, there could be circumstances by which ROWs could be approved, with accompanying surface disturbance in these areas. Alternatives D would not designate any ACECs and would offer the least protection of all the alternatives; Alternative A would continue management of the existing 1,375 acres Negro Bill Canyon ONA, offering only slightly more protection to vegetation. Alternatives A and D do not propose to manage any lands for wilderness characteristics, offering less protection for vegetation than either Alternatives B or C.

Under all of the alternatives, the continued withdrawal of lands from mineral entry along the Colorado, Dolores, and Green Rivers (encompassing 65,037 acres), and within the Westwater and Black Ridge wilderness areas (13,296 acres), would beneficially protect vegetation resources (mostly juniper and desert shrub) in the long term by eliminating potential surface-disturbance-related impacts from mineral entry.

4.3.17.5 Impacts of Livestock Grazing Decisions on Vegetation Resources

In general, making areas unavailable for grazing would provide long-term protection and enhancement of vegetation because it would limit the loss of vegetative cover and the trampling of species. Areas available for livestock grazing generally suffer some adverse impacts due to decreased growth or loss of riparian and other vegetation.

Under all of the alternatives, livestock grazing would be managed according to the Guidelines for Grazing Management in order to achieve and maintain the Standards for Rangeland Health.

Under the Guidelines, the proper functioning condition of wetlands and riparian areas would be promoted, the use and perpetuation of native species would be emphasized, noxious weed establishment and spread would be minimized, and adjustments would be made to grazing practices when vegetation proper functioning conditions are not being met. These guidelines and standards would generally mitigate the impacts of livestock grazing on vegetation resources. However, the potential for impacts still exists and would be greater under alternatives with a higher percentage of lands available for grazing.

The following Table 4.128 shows a comparison of the numbers of acres excluded from livestock grazing by alternative. Alternative B would exclude the most acres, followed by Alternative A, Alternative C, and Alternative D, respectively. Acreages vary slightly between alternatives.

Table 4.128. Acres of Each Vegetation Type Excluded from Grazing by Alternative

Habitat	Alternative A	Alternative B	Alternative C	Alternative D
Desert shrub	13,697	23,880	14,952	13,324
Sagebrush and perennial grassland	3,806	5,569	2,980	1,767
Conifer and mountain shrub	23,155	23,404	22,579	587
Pinyon-juniper woodland	84,301	98,628	71,809	35,369
Riparian/Wetland	1,568	1,852	1,556	862
Total	**126,527**	**153,333**	**113,876**	**51,909**

More areas would be unavailable for grazing under Alternative B than Alternatives A, C, and especially D, which could have beneficial impacts on native vegetation depending on the success of re-vegetation and weed control efforts following the removal of livestock. Management under the rangeland standards and guidelines would increase the likelihood of native vegetation establishment, with long-term beneficial impacts to vegetation resources. In the long term, Alternative B would likely have fewer adverse impacts on native vegetation in the MPA when compared to any other alternative because of the additional unavailable for livestock grazing. Alternative D would have the greatest likelihood of adverse impacts on native vegetation in the MPA because fewer acres are rendered unavailable for grazing in this alternative.

Fewer vegetation treatments are proposed under these alternatives than Alternative B, which would reduce the short-term surface disturbance impacts on vegetation removal but would also decrease the potential long-term benefits of increased vegetation health.

Vegetation treatments under all of the alternatives in allotments to increase wildlife forage would have long-term, beneficial impacts on vegetation by expanding the acreage of native and other desired vegetation species into existing pinyon-juniper woodlands. Alternatives B, C, and D would designate more area (a total of 46,307 acres under each alternative) for conversion than Alternative A (67,125 acres), but the relative size of the affected areas and the impacts under all of the alternatives would be similar.

4.3.17.6 Impacts of Minerals Decisions on Vegetation Resources

Surface disturbance associated with mineral exploration and development would result in both short-term impacts and long-term adverse impacts on vegetation. In the short term, loss of vegetation associated with surface disturbances for well pads, access roads, and minerals infrastructure would increase the potential for invasion of undesirable plant species, including noxious weeds, and cause a potentially irretrievable loss of vegetation productivity during the period of disturbance and re-growth.

While the RFD assumes that reclamation of disturbance would be successful within a scope of 10 years, it does note that reclamation times would be dependent on soils, vegetation, and rainfall (BLM 2005f). The typically slow re-growth of vegetation within the MPA would cause surface disturbance to have long-term, indirect, adverse impacts on vegetation resources. Initial establishment of sagebrush and other native species following seeding is estimated to take 3 to 4 years, depending on the successful exclusion of livestock and weedy annuals from the site during this time (Monsen et al. 2004). Revegetation is especially difficult in desert shrub habitat, because soils are shallow and highly saline, and moisture availability is relatively low (Monsen et al. 2004). The potential long-term, adverse introduction and establishment of undesirable plant species, particularly cheatgrass, is likely in the sagebrush/perennial grass vegetation cover type due to cheatgrass ability to out-compete native species in disturbed areas and to thrive in arid conditions (Morrow and Stahlman 1984; Piemeisel 1951).

Although the acreages open to mineral leasing vary by alternative and would include a substantial portion of the MPA, the true indicator of impacts to vegetation come from the surface disturbance associated with the predicted RFD for minerals. Proposed surface disturbances from these activities are outlined in Table 4.129. Impacts to vegetation resources would be adverse, but would impact a relatively small portion of the MPA.

Table 4.129. Predicted Surface Disturbance on BLM Lands from Minerals Activities for the 15-Year Life of the Plan (Acres)

Type of Disturbance	Alternative A	Alternative B	Alternative C	Alternative D
Surface disturbance from oil and gas development	6,772	3,963	6,483	6,739
Geophysical surface disturbance	2,397	1,404	2,072	2,329
Surface disturbance from mineral activities other than oil and gas	1,015	1,015	1,015	1,015
Total surface disturbance	10,184	6,382	9,570	10,083
% of surface disturbance within the MPA	0.005	0.002	0.005	0.005

4.3.17.7 Impacts of Non-WSA Lands with Wilderness Characteristics Decisions on Vegetation Resources

4.3.17.7.1 Alternatives A and D

Under these alternatives, no non-WSA lands with wilderness characteristics would be managed to maintain those characteristics. The impacts on vegetation resources would be potentially adverse in the long term because no prescriptions specifically to maintain wilderness characteristics would be specified to protect these areas from surface disturbances.

4.3.17.7.2 Alternatives B and C

Alternatives B and C would manage for wilderness characteristics on 266,485 acres and 47,761 acres, respectively. Logically, Alternative B would offer the greatest protection of all alternatives due to the large number of acres that would be managed as closed to mineral leasing and woodland harvest.

Non-WSA lands with wilderness characteristics would be designated as VRM Class II and would be closed to oil and gas leasing in Alternative B and would be managed as no surface occupancy in Alternative C. They would be closed to woodland harvest under both alternatives. These actions would preclude most large-scale surface-disturbing activities, thereby offering beneficial impacts to vegetation resources.

Management of non-WSA lands with wilderness characteristics (266,485 acres in Alternative B and 47,761 acres in Alternative C) would limit the type of treatments needed to reclaim or restore sagebrush-steppe habitat. Mechanical treatments would not be allowed in these areas.

4.3.17.8 Impacts of Recreation Decisions on Vegetation Resources

In general impacts from recreation activities on vegetation would be limited to isolated surface disturbances where activities such as dispersed camping and cross country hiking occur. These impacts would be mitigated by the application of the MFO Recreation Rules and the Standards for Public Land Health and Guidelines for Recreation Management. Where recreation is managed using a Special Recreation Management Area, (SRMA) these rules and guidelines would limit or control activities through specialized management tools such as designated campsites, permits, area closures, and limitations on number of users and duration of use. In addition efforts would be made to educate public land visitors and users about the ethics of responsible use.

4.3.17.8.1 Alternative A

The short-term and long-term, adverse impacts from recreational activities within the 132,832 acres of existing SRMAs (Cameo Cliffs, Canyon Rims, and Colorado River) would be minor to vegetation because 1) motorized and non-motorized travel would be limited to existing, designated routes, and 2) adaptive management would be applied to camping sites to limit

impacts to vegetation, as discussed above. Table 4.130 shows the approximate acreage of vegetation within each SRMA for all of the alternatives.

Within the Moab ERMA, motorized recreational OHV use would have short-term and long-term, adverse impacts on all vegetation types from OHV-related surface disturbances as approximately 620,212 acres (34% of the MPA) would continue to be designated as open to cross-country OHV use (see Section 4.3.17.13 below). This surface disturbance would adversely impact the scenic resources that visitors come to the MPA to enjoy.

Table 4.130. SRMA Acreages Proposed Under Each Alternative

SRMA	Alternative A	Alternative B	Alternative C	Alternative D
Bookcliffs	0	348,105	0	0
Cameo Cliffs	15,456	15,473	15,473	15,473
Canyon Rims	101,523	101,523	101,523	101,526
Colorado River	15,853	101,523	87,336	76,375
Labyrinth	0	298,711	298,711	0
Lower Gray	0	3,527	3,527	0
Sand Flats	0	6,245	6,245	6,246
South Moab	0	63,577	63,577	0
Two Rivers	0	28,540	28,540	12,481
Utah Rims	0	15,175	15,175	0
Dee Pass	0	0	0	60,421
Total	**132,832**	**982,399**	**620,107**	**272,522**

4.3.17.8.2 ALTERNATIVE B

Alternative B would manage 982,399 acres under existing and proposed SRMAs (seven times more acreage than under Alternative A). The impacts to vegetation within these SRMAs would be as discussed under Alternative A because of prohibitions and/or restrictions on surface disturbances to protect recreation resources and scenic values. The impacts on vegetation within the ERMA would be minor to negligible also because no acres would be designated as open to OHV cross-country travel, and all recreation-related travel would be restricted to existing, designated routes. The impacts to vegetation from dispersed camping within SRMAs would be negligible, as adaptive management could be applied to manage surface disturbance impacts resulting from dispersed camping to these areas. Compared to Alternative A, this alternative would have greater, long-term, beneficial impacts on vegetation because of the increased restrictions on cross-country OHV travel and dispersed camping.

4.3.17.8.3 ALTERNATIVE C

Alternative C would manage a total of 620,107 acres under SRMAs (approximately five times more acreage than under Alternative A). The impacts to vegetation would be similar to those discussed under Alternative B, except that 1,086 acres would be managed as Open to OHV

cross-country use within the White Wash Sand Dunes area. The impacts on vegetation in this OHV area would be negligible, as very little vegetation covers this proposed open OHV focus area.

4.3.17.8.4 ALTERNATIVE D

The impacts on vegetation under this alternative would be similar to the discussion under Alternative C, because the limitations on surface disturbances to vegetation would be similar. However, this alternative would designate 272,522 acres as SRMAs (twice as much area as under Alternative A, but three times less than Alternative C), with travel within the MPA limited to designated routes except for 3,064 acres of open OHV use in the White Wash Sand Dunes focus area (an area, as discussed above, that has little vegetation).

4.3.17.9 IMPACTS OF RIPARIAN DECISIONS ON VEGETATION RESOURCES

Compliance with the BLM National Riparian Policy under all alternatives and the exclusion of surface disturbing activities within 100 meters of riparian areas under all action alternatives would result in long-term, beneficial impacts to riparian vegetation. This stipulation would eliminate surface-disturbing activities because surface disturbances would be avoided in order to maintain and to improve riparian vegetation. These beneficial impacts would be the result of travel routes that would be located or re-located away from riparian areas; prohibitions on woodcutting (except for limited cutting of willows for Native American ceremonial purposes); dispersed camping in riparian areas that would be avoided and/or managed to reduce riparian vegetation impacts; exotic species management that would be applied to reduce their spread; and grazing actions that would be managed to ensure proper functioning condition of riparian vegetation.

4.3.17.10 IMPACTS OF SOILS/WATERSHED DECISIONS ON VEGETATION RESOURCES

Generally any decisions that protect soils from surface disturbance would also protect vegetation as the two resources are closely linked. Under all action alternatives, vegetative cover would be maintained, based on desired future conditions, to provide adequate ground cover to prevent accelerated erosion of wind-erodible soils. In addition, no additional OHV routes would be allowed in saline soils other than those already designated in the proposed Travel Plan. These actions would have long-term, beneficial impacts on vegetation by maintaining and protecting vegetation in these areas.

All of the action alternatives would also apply a controlled surface use stipulation excluding surface-disturbing activities within 100-year floodplains, within 100 meters of springs, or public water reserves. In addition, a controlled use stipulation would be applied to all slopes in the MFO greater than 30%. These management actions would benefit vegetation in the long term by limiting surface-disturbance-related impacts to the resource. Table 4.131 shows the size of vegetation communities protected by the controlled surface use stipulation on steep slopes.

Table 4.131. Acres of Each Vegetation Type Protected in the Action Alternatives Due to Slope Steepness Category

Vegetation Type	Acres protected due to slopes >30%	Acres protected due to slopes 21-30%
Conifer/mountain shrub	33,954	13,856
Desert shrub	20,707	16,146
Invasive species and weeds	196	209
Pinyon-juniper	200,559	108,046
Riparian/wetland	2,181	1,234
Sagebrush/perennial grass	9,352	5,841
Total	**266,949 (14.6%)**	**145,332 (0.08%)**

4.3.17.10.1 Alternative A

Under this alternative, a timing limitation would prohibit all surface-disturbing activities on 313,800 acres of saline, erodible, Mancos Shale soils (17% of the MPA) from November 1 to April 30. These restrictions would have indirect, beneficial impacts on vegetation by 1) reducing soil erosion that could otherwise adversely cover or bury existing plant communities, and 2) reduce the likelihood of exotic, invasive weed establishment in these areas as seeds are brought in by machinery.

4.3.17.10.2 Alternatives B and C

The indirect, beneficial impacts to vegetation would be similar to those discussed under Alternative A because the management actions are similar: timing restrictions would be applied to 330,142 acres of Mancos Shale soils (18% of the MPA).

4.3.17.10.3 Alternative D

Under this alternative, no timing limitations on surface-disturbing activities within saline soils would be applied, which would have indirect, adverse impacts on Mancos Shale vegetation communities from potential surface disturbances that would increase the likelihood of invasive, exotic species establishment and erosion-related impacts to vegetation. Compared to Alternative A, this alternative would have greater adverse impacts on vegetation.

4.3.17.11 Impacts of Special Designations Decisions on Vegetation Resources

4.3.17.11.1 Areas of Critical Environmental Concern

Under alternatives B and C, where Areas of Critical Environmental Concern (ACECs) overlap Wilderness Study Areas, WSA management would take precedence. This land would be managed according to the Interim Management Policy and Guidelines for Lands Under

Wilderness Review (IMP) which precludes surface-disturbing activities. This would have beneficial impacts on vegetation resources. Please see the WSA section for details.

Any areas proposed for designation as ACECs would be managed as NSO for oil and gas leasing and preclude other surface disturbing activities. They would also be managed as avoidance areas for ROWs. These actions would offer beneficial impacts because, as noted in the Lands and Realty section, surface-disturbing activities would be precluded.

4.3.17.11.1.1 Alternative A

No ACECs would be designated under Alternative A; therefore, no beneficial impacts would occur to vegetation as a result of ACEC designation.

4.3.17.11.1.2 Alternative B

Under Alternative B, all 14 potential areas totaling 613,077 acres would be designated as ACECs. Approximately 309,599 acres of this total are within WSAs and would be protected under the IMP as noted above. The remaining 300,576 acres would be managed with either a NSO or closed stipulation for oil and gas leasing and preclude other surface-disturbing activities. Since surface disturbance is one of the greatest threats to vegetation (due to the displacement of soil and plant matter and the subsequent risk of noxious weed spread) this prescription offers a high degree of beneficial protections.

Alternative B would include other management restrictions in each of the proposed ACECs that would provide greater increased protection for vegetation than the other alternatives. The additional management restrictions include restricting vehicle-based camping to campgrounds, not allowing campfires outside of campgrounds, closing areas to surface disturbing vegetation treatments except for treatments for noxious weeds and exotics, and closing the area to harvesting woodland products. The greatest protection from the proposed ACECs would be to the pinyon-juniper and desert shrub vegetation types largely due to their abundance in proposed areas.

More restrictive management prescriptions to enhance white tailed prairie dog habitat such as AMPs and grazing systems would be developed to benefit vegetation under Alternative B. Additionally, restrictions developed to protect the three special status plant species located in the Highway 279/Shafer Basin/Long Canyon and Behind the Rocks proposed ACECs including recreation restrictions for camping and OHV use would be beneficial to vegetation. Alternative B would not allow competitive OHV events in the Colorado River Corridor ACEC, thereby providing more protection that Alternative A. Additionally, no new road construction would be allowed in Labyrinth Canyon resulting in short- and long-term beneficial impacts to vegetation. Beneficial impacts would include protection from crushing, trampling, or uprooting by motorized vehicles.

4.3.17.11.1.3 Alternative C

Under Alternative C, 5 areas (63,252 acres) would be designated as ACECs including, Behind the Rocks, Cottonwood-Diamond Watershed, Highway 279/Shafer Basin/Long Canyon, Mill Creek Canyon, and Ten Mile Wash. These designations would result in similar impacts to vegetation as discussed under Alternative B due to similar management requirements, but only for the five proposed areas.

4.3.17.11.1.4 Alternative D

Under Alternative D, none of the potential ACECs would be designated, so impacts would be similar to those in Alternative A. In comparison to the other action alternatives, Alternative D would allow the greatest number of acres open to oil and gas leasing resulting in the greatest number of adverse impacts to vegetation.

The Bookcliffs, Canyon Rim, Cisco White Tailed Prairie Dog Complex, Labyrinth Canyon, Westwater Canyon, and Wilson Arch areas would be managed with the same requirements as Alternative C. Under this alternative, the Colorado River Corridor would experience similar impacts to vegetation as those described under Alternative C with the exception that it would have greater potential for surface disturbance from the area being open to minerals material disposal and geophysical exploration for oil and gas

Alternative D would manage the White Wash area under the prescriptions of the White Wash Sand Dunes Open OHV Area within the proposed Dee Pass SRMA. Competitive motorized events would be allowed; however, since the open use is in a designated area that lacks vegetation, it is not anticipated that there would be any adverse impacts to vegetation. The area does include some cottonwoods and rocky areas but would not be affected by motorized use.

4.3.17.11.2 Wild and Scenic Rivers

Under Alternatives B and C for Wild and Scenic Rivers, the stipulations that would be applied to oil and gas leasing and other surface-disturbing activities within suitable river segments were developed based on other resource values such as scenery, wildlife and fishery, riparian, and recreation. Any segments identified as suitable are either within areas either closed to oil and gas leasing or with a NSO stipulation under Alternatives B and C resulting in increased protection for riparian vegetation.

Under Alternatives A and D, no areas would be determined as suitable, thereby offering no protections to vegetation because of WSR designations.

Under Alternative B 287.5 river miles would be determined as suitable. This would protect riparian vegetation within these areas because they would be managed as NSO areas.

Under Alternative C 127.3 river miles (10 river segments) would be determined as suitable and would be managed as NSO areas.

4.3.17.11.3 Wilderness Study Areas and Wilderness Areas

Under all alternatives, there is no surface disturbance, permanent new development, or rights-of-way allowed in WSAs or in Wilderness Areas. Additionally, these lands are closed to oil and gas leasing which would provide protection from surface-disturbing impacts to vegetation.

Approximately 348,815 acres of the MPA are included as WSAs for each of the alternatives. WSAs include Behind the Rocks; Black Ridge and Lost Spring Canyon; Desolation Canyon, Floy Canyon, Flume Canyon, Mill Creek Canyon, Negro Bill Canyon, and Spruce Canyon; and Westwater Canyon. Black Ridge is a 5,200 acre designated wilderness area

Alternative B offers the most protection to vegetation by closing all WSAs and Wilderness Area to OHV use while Alternative A offers the least protection by limiting motorized use to inventoried areas.

Additionally, all WSAs and Wilderness Areas would be designated as VRM Class I, which would preclude surface disturbance thereby offering beneficial protections to vegetation.

4.3.17.12 Impacts of Special Status Species Decisions on Vegetation Resources

Under all of the alternatives, compliance with the Endangered Species Act (ESA) requires avoiding and/or minimizing surface-disturbing activities in Threatened and Endangered species habitat. This would indirectly benefit vegetation by limiting or restricting activities that would disturb vegetation in these habitats. Managing sage-grouse as a Sensitive species, the BLM's National Sage-grouse Habitat Conservation Strategy, the Conservation Assessment of Greater Sage-grouse and Sagebrush Habitats, and the Gunnison Sage-grouse Range-wide Conservation Plan would be implemented in suitable habitat in the MPA, including developing and implementing sage-grouse habitat restoration, conserving sage-grouse habitat, and identifying important habitat. Compliance with these plans would have similar beneficial impacts on vegetation resources by providing long-term, beneficial protection for sagebrush and perennial grassland vegetation types in the MPA.

There would be no ground-disturbing activities allowed within a 1.0-mile radius of known bald eagle nests and within a 0.5 mile radius of Mexican spotted owl (MSO) nests, which would provide long-term protection to conifer and mountain shrub vegetation in those buffer zones. MSO Protected Activity Centers (PACs) would be protected as outlined in the MSO Recovery Plan (USFWS 1995), and cooperative agreements would be established with other agencies and entities to inventory and monitor existing potential habitat and annually schedule assessment plans of MSO habitat to determine quality of habitat and presence of species. These actions would have long-term, beneficial protection-related impacts on vegetation resources because habitat protection would also protect vegetation resources.

In Jones Cycladenia and suitable habitat, site inventories for all surface-disturbing projects (including prescribed burns) would be required, and road construction, land disposal, and ROW corridors in suitable *Cycladenia* habitat would be avoided. The use of chemical treatments, herbicides, and habitat manipulations in this habitat would also be restricted, which would have long-term beneficial impacts on vegetation resources.

Within endangered Colorado River fish habitat, there would be no surface-disturbing activities within the 100-year floodplain of the Colorado River, Green River, and at the confluence of the Dolores and Colorado Rivers, which would have long-term, beneficial impacts on riparian and wetland vegetation resources in those buffer zones. In addition, the riparian habitat utilized by southwestern willow flycatcher and yellow-billed cuckoo is governed by a controlled surface use stipulation excluding surface disturbing activities, benefiting riparian and woodland vegetation resources.

4.3.17.12.1 Greater Sage-Grouse

4.3.17.12.1.1 Alternative A

Under Alternative A, no management actions are specified for protection of sage-grouse habitat, except as discussed under actions common to all alternatives above.

4.3.17.12.1.2 Alternative B

The special status species management decisions for Alternative B would identify and manage more greater sage-grouse habitat acreage (12,850 acres) and this would benefit vegetation more than the other alternatives. This alternative would require that any surface occupancy that could result in the loss or fragmentation of this habitat be avoided or minimized. If surface occupancy cannot be avoided, sagebrush habitat would be reclaimed at a ratio of 2:1. This would beneficially protect approximately 12,850 acres of sagebrush-steppe habitat in the long term from surface disturbance and occupancy. Also under Alternative B, in lek habitat (a 2-mile radius around an active strutting ground), there would be no surface-disturbing activities from March 1 to May 15, and no aboveground facilities would be allowed within a 2-mile buffer year round. In nesting and brood-rearing habitat there would be no surface-disturbing activities from March 15 to July 15. In winter habitat there would be no surface-disturbing activities allowed from November 15 to March 14 on 12,850 acres. These restrictions would mitigate the adverse impacts of surface-disturbing activities in lek, winter, and nesting and brood-rearing habitat, with beneficial impacts on the vegetation resources within these areas.

4.3.17.12.1.3 Alternatives C and D

Alternatives C and D would identify 3,068 acres and 1,986 acres, respectively, of sagebrush habitat to be managed for sage-grouse. Similarly, the alternatives would avoid or minimize the loss or fragmentation of this habitat. If surface disturbance cannot be avoided, these alternatives would reclaim sagebrush habitat at a ratio of 1:1. Under all three action alternatives greater sage-grouse habitat would then be subject to controlled surface use and timing limitation stipulations with subsequent reduced risks of surface disturbance to vegetation resources in 1,986 to 12,850 acres of sagebrush.

The same timing restrictions applied to greater sage grouse habitat discussed under Alternative B would also apply to Alternatives C and D with similar beneficial impacts on vegetation resources; however, the lek habitat radius would be reduced to 0.5 mile for Alternative C, and 0.25 mile for Alternative D. The decrease in acreage excluded from surface disturbance and

surface occupancy in and around sage-grouse leks would increase the risk of adverse impacts on vegetation resources. Under Alternative C, 9,782 more acres (76%) of sage-grouse habitat, and under Alternative D, 1,082 more acres (35%) of greater sage-grouse habitat would be available for surface-disturbing activities and/or surface occupancy, compared to Alternative B. Compared to Alternative A, the action alternatives would be more beneficial because specific management prescriptions would be applied to protect greater sage-grouse habitat.

4.3.17.12.2 GUNNISON SAGE-GROUSE

Under Alternative B, 246,107 acres of pre-settlement Gunnison sage-grouse habitat would be subject to controlled surface use and timing stipulations if Gunnison sage-grouse are present. This area is 29% larger than Alternative C (175,727 acres) and 83% larger than Alternative D (41,620 acres).

All of the action alternatives would prohibit surface-disturbing activities from March 20 to May 15 in lek habitat, and construction of fences would be prohibited or limited year-round. Alternative B would provide for the highest degree of vegetation resource protection, with a 2-mile radius around active strutting grounds (within sagebrush and perennial grasses), which would have beneficial impacts as discussed above for greater sage-grouse. The impacts of Alternatives C and D would also have habitat protection zones similar to greater sage-grouse, with impacts to vegetation resources as discussed above, with a similar comparison to Alternative A.

4.3.17.12.3 WHITE-TAILED PRAIRIE DOG

Under Alternative B, 117,481 acres of white tailed prairie dog habitat within the Cisco White Tailed Prairie Dog ACEC would be managed to protect the species, which would have long-term, beneficial impacts to desert shrub vegetation by designating the area with an NSO leasing stipulation. An additional 82,024 acres of habitat outside of the ACEC would be managed as controlled surface use allowing no surface disturbing activities within 1300 feet of prairie dog colonies. Compared to Alternative A, this alternative would be more beneficial to vegetation resources because surface disturbances to vegetation would be restricted within the NSO and CSU areas.

Alternatives C and D would manage 117,481 acres (41% less) of habitat and 31,186 acres (84% less) of habitat (respectively) than Alternative B, with controlled use leasing stipulations within 660 feet of active prairie dog colonies. The impacts to vegetation resources would be beneficial in the long term near active colonies because surface disturbances would be prohibited; however, outside of these active areas, surface disturbances would be permitted, which would have long-term, adverse impacts to the resource. Compared to Alternative A, these alternatives would have similar impacts because the level of permitted surface disturbances to vegetation would be similar.

4.3.17.12.4 Gunnison Prairie Dog Habitat

Under Alternatives B and C, 10,700 acres of Gunnison prairie dog habitat would be managed under controlled use leasing stipulations, which would prohibit surface-disturbing activities within 1,300 feet of these colonies for Alternative B and 660 feet of prairie dog colonies for Alternative C. The impacts to vegetation would be similar to those discussed above for Alternatives C and D for white-tailed prairie dogs because the habitat would be open to minerals-related disturbances except for the zones around active prairie dog colonies. The impacts to vegetation would be similar to those for the white-tailed prairie dog habitat and for the same reasons.

4.3.17.13 Impacts of Travel Management Decisions on Vegetation Resources

4.3.17.13.1 Alternative A

As discussed in Section 4.3.17.8 Recreation, Alternative A would have direct and indirect, short-term and long-term, adverse impacts on all vegetation types from cross-country OHV use within the 620,212 acres (34% of the MPA) designated as open to OHV use (see Table 4.132 below). Short-term, direct impacts would include fugitive dust production that would adversely inhibit vegetation productivity. Long-term, direct impacts would include loss of vegetation and long-term loss of vegetation productivity in disturbed areas from trampling and crushing. Indirect, adverse impacts to vegetation would result from unvegetated or sparsely vegetated, exposed, disturbed soils that would increase the opportunities for the establishment and spread of non-native, exotic weed species.

Table 4.132. OHV Area Designations for All Alternatives

Designation	Alternative A	Alternative B	Alternative C	Alternative D
Total Closed Acres	5,062	347,424	339,298	57,351
Total Open Acres	620,212	0	1,866	3,064
Total Limited to Designated Routes Acres	1,196,920	1,475,074	1,481,334	1,762,083

4.3.17.13.2 Alternatives B, C, and D

Under the action alternatives, travel within the MPA would be confined to designated routes for motorized (scenic and OHV) and non-motorized/mechanized (mountain bike) use. In addition, trails would be provided for non-mechanized (hiking, equestrian, backpacking) travel. Alternatives C and D would permit open OHV use only in the focus area within the White Wash Sand Dunes, but this area is sparsely vegetated and would have negligible impacts on vegetation resources within the 1,866 acres proposed under Alternative C or the 3,064 acres proposed under Alternative D. The impacts of travel along designated routes would have negligible impacts on vegetation because past and current use has already impacted these areas. Compared to Alternative A, these alternatives would be more beneficial to vegetation resources because the impacts from the open OHV use areas would be greatly reduced, and those areas impacted in the past could recover.

4.3.17.14 Impacts of Vegetation Decisions on Vegetation Resources

Under management common to all action alternatives, consideration would be given to the preservation and improvement of sagebrush plant communities during the implementation of vegetation and land treatments, and during wildland fire suppression planning. In accordance with sagebrush conservation guidance, up to 257,809 acres of sagebrush and scrub-steppe habitat would be reclaimed and restored. Riparian vegetation communities would be managed to restore native species and to reduce invasive, non-native species. All of these actions would have long-term, protection- and preservation-related beneficial impacts on vegetation resources.

4.3.17.14.1 Alternative A

There are no specific vegetation management decisions under this alternative.

4.3.17.14.2 Alternative B

Under Alternative B, the loss of sagebrush-steppe habitat from BLM initiated or authorized actions would be avoided or minimized, and loss of sagebrush-steppe habitat essential to wildlife would be reclaimed at a ratio of 2:1. This would have long-term, beneficial impacts on these vegetation communities because reclamation would expand the range of these communities. This alternative would have more beneficial impacts on sagebrush-steppe vegetation than Alternative A because Alternative A does not propose to reclaim sagebrush-steppe vegetation communities.

4.3.17.14.3 Alternatives C and D

Under Alternatives C and D, the impacts of vegetation management decisions on vegetation resources would be similar to those discussed under Alternative B, but to a lesser degree, because the loss of sagebrush-steppe habitat essential to wildlife would be reclaimed at a ratio of 1:1 instead of 2:1. Therefore, 50% fewer acres of sagebrush-steppe habitat would be reclaimed when compared to Alternative B. Accordingly, these alternatives would have fewer beneficial impacts on vegetation resources than Alternative B, but compared to Alternative A the impacts would be more beneficial for reasons as discussed under Alternative B.

4.3.17.15 Impacts of Wildlife and Fisheries Decisions on Vegetation Resources

4.3.17.15.1 Impacts Common To All Alternatives

Under all alternatives, surface-disturbance activities, vegetation-altering projects, and broad-scale use of pesticides in identified occupied migratory bird habitat would be avoided during nesting season (May 1 through July 30). Under all of the alternatives, continued implementation and modification of three Habitat Management Plans (HMPs) would take place. Sagebrush habitat improvements would occur under the Hatch Point HMP providing protection for sagebrush vegetation species in these areas. Implementation of the Dolores Triangle HMP would result in habitat improvements for riparian and native and naturalized fish habitat thus benefiting riparian vegetation. Additionally, 278,000 acres of habitat on land administered by the BLM would be maintained in good condition and habitat would be improved where needed under the

Potash-Confluence HMP thereby benefiting varied vegetation types. These actions would have long-term, beneficial impacts on native vegetation in lowland riparian, wetland, and upland communities in the MPA.

4.3.17.15.2 Impacts Common To All Action Alternatives (B, C and D)

In the Cisco Desert HMP the percent of browse and forb species would be increased on 6,375 acres of perennial grass vegetation, and livestock grazing activities would be excluded from May 15 through June 20 to reduce disturbance and improve pronghorn habitat. In the Hatch Point HMP a total of 69 acres would be seeded with a combination of forbs, grasses, and shrubs, and a rest/rotation grazing plan would be recommended to improve pronghorn habitat. Improvement of 42,500 acres of crucial bighorn sheep habitat by limiting major human disturbance would take place in the Potash-Confluence HMP. In addition, any future proposal for a change in kind of livestock from cattle to sheep in Rocky Mountain bighorn habitat would be denied. These changes would help mitigate the adverse impacts of surface-disturbing activities on vegetation resources critical to pronghorn, desert bighorn sheep, and Rocky Mountain bighorn sheep survival. For additional information on vegetation types included in these habitats, including the acreages, please refer to Section 4.3.19, Wildlife and Fisheries.

4.3.17.15.3 Alternative A

Under Alternative A, surface-disturbance restrictions would be in place for wildlife habitat only during parts of the year. Specifically, exclusions for grazing would be in place during May and June to protect and improve pronghorn habitat. Protections for bighorn sheep and Rocky Mountain bighorn sheep habitat including reductions in grazing and human disturbance would be beneficial to vegetation particularly in the pinyon-juniper vegetation type. Compared to Alternatives B, C, and D, Alternative A would have the least amount of wildlife habitat subject to special wildlife conditions.

4.3.17.15.4 Alternative B

Under Alternative B, management actions in riparian areas would be implemented with the goal of ensuring a multi-aged community, allowing for retention of snags and diseased trees, and providing multiple layers of vegetation within 10 feet of the ground. Additionally, restrictions concerning surface occupancy and surface-disturbing activities would be established for wildlife habitat during parts of the year, dispersed camping in riparian areas would be restricted, prescribed fire treatments would be judiciously applied to improve vegetation productivity, and grazing season of use would be modified to improve wildlife forage productivity. Current pronghorn habitat (822,001 acres) within Cisco Desert and Hatch Point (the La Sal Wildlife Management Units) would be protected by applying a timing limitation stipulation that would preclude surface-disturbing activities from May 1 to June 15. Spring grazing would be removed on 188,975 acres of allotments to protect crucial pronghorn habitat and encourage forb production. This would likely reduce grazing impacts to the desert shrub and pinyon-juniper vegetation cover types. An NSO stipulation for oil and gas leasing and precluding other surface-disturbing activities would protect desert bighorn sheep lambing, rutting, and migration habitat (130,419 acres) and the desert shrub vegetation type associated with this habitat. Under

Alternative B, management of 458,242 acres of habitat for Rocky Mountain bighorn sheep would include improving or maintaining vegetative conditions and the ecological condition of rangelands in the sagebrush and perennial grass vegetation types. All of these actions would have long-term, beneficial impacts on vegetation by 1) reducing and/or minimizing surface disturbances to vegetation, and 2) managing for achieving proper functioning conditions in wildlife habitat and in riparian areas. Compared to Alternative A, this alternative would have more beneficial impacts to vegetation resources because more area would be managed for protection of the resource.

4.3.17.15.5 ALTERNATIVE C

Under Alternative C, the impacts of wildlife and fisheries management decisions on vegetation resources would be similar to those discussed under Alternative B, but to lesser degree because grazing restrictions would be applied to a smaller area (293,741 acres of crucial pronghorn habitat to encourage forb production) and fewer acres of protection for desert bighorn sheep (101,897 acres) and Rocky Mountain bighorn sheep (310,726 acres), Additionally, restrictions concerning surface occupancy and surface-disturbing activities would be established for wildlife habitat during parts of the year. Under this alternative, there would be 42% more acres of recognized Rocky Mountain bighorn sheep habitat than under Alternative A, benefiting sagebrush and perennial grass vegetation types, and 77% more acres of protected deer and elk habitat than under Alternative A, benefiting all vegetation types discussed in this section. Because of these differences, management decision under Alternative C would be less likely to adversely affect vegetation resources in wildlife protection areas of the MPA than those under Alternative A.

4.3.17.15.6 ALTERNATIVE D

Under Alternative D, the impacts of wildlife and fisheries management decisions on vegetation resources would be similar to Alternative C, except that no season of use adjustments to protect pronghorn habitat would be made, pronghorn fawning habitat protection would encompass 78,477 acres, desert bighorn sheep protection would include 46,319 acres, and protection of Rocky Mountain bighorn sheep habitat would include 194,560 acres. When compared to Alternative A, this alternative would have more beneficial impacts to vegetation resources because management actions common to all action alternatives would ensure greater protection and enhancement of vegetation resources than Alternative A.

4.3.17.16 IMPACTS OF WOODLANDS DECISIONS ON VEGETATION RESOURCES

Short-term, adverse, direct impacts of woodland harvest would include trampling of understory vegetation from vehicles accessing harvesting areas and during woodland harvesting and removal. Long-term, indirect impacts would include the potential introduction of weedy, non-native species into areas with surface disturbances caused by woodland harvesting and removal, and related vehicle use. Table 4.133 shows the acreages open and closed to woodland harvest.

Table 4.133. Number of Acres in the MPA Open and Closed to Woodland Harvesting

Zone	Alternative A	Alternative B	Alternative C	Alternative D
Total Closed	601,146	827,063	646,694	601,146
Total Open (with comparison to Alternative A)	1,217,635	991,198 (-19%)	1,172,436 (-4%)	1,217,635 (0%)
Actual Woodland Coverage (pinyon-juniper) in Open Areas	437,216 (35% of Open Area)	329,895 (31% of Open Area)	411,905 (34% of Open Area)	437,216 (35% of Open Area)

The potential short-term and long-term, direct and indirect, adverse impacts to vegetation resources would be similar for all of the alternatives because all open harvesting areas with woodland coverage would be similarly impacted by vehicles accessing harvesting sites and by trampling and other surface disturbances related to this activity. Under Alternative B, the impacts would be to a lesser degree because a smaller total area (107,321 fewer acres) would be open to harvesting-related surface disturbances.

4.3.17.17 Summary of Impacts

Table 2.2 (of Chapter 2) summarizes the impacts of the various alternatives and their program actions on vegetation.

4.3.18 Visual Resources

This section discusses impacts to visual resources from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning visual resources are described in Chapter 3.

The BLM's VRM class objectives were used in analyzing impacts on visual resources. These objectives provide a baseline for determining how much a proposed management action would affect visual resources/scenic quality, as well as determining the level of disturbance an area can support while still meeting visual resource objectives.

The following BLM VRM class objectives and descriptions are summarized from BLM Manual Handbook H-8431-1 (1986b).

<u>VRM Class I</u>

> The objective of Class I is to preserve the existing character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activities. The level of change to the characteristic landscape should be very low and should not attract attention.

VRM Class II

The objective of this class is to retain the existing character of the landscape. The level of change to the landscape should be low. Management activities may be seen, but should not attract the attention of the casual observer. Any changes to the landscape must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

VRM Class III

The Class III objective is to partially retain the existing character of the landscape. The level of change to the landscape should be moderate. Management activities may attract the attention of the casual observer, but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

VRM Class IV

The objective of Class IV is to provide for management activities that require major modifications to the existing character of the landscape. The level of change to the landscape can be high. The management activities may dominate the view and may be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repetition of the basic visual elements of form, line, color, and texture.

In addition, since the current RMP did not identify visual management objectives for the MPA during the last RMP process (except for the Canyon Rims area) the VRM inventory will serve as the baseline (i.e., Alternative A) by which impacts to visual resources are analyzed in this EIS. If Alternative A were to be adopted, these VRM inventory classes would become management classes. The acres designated through the VRM inventory more accurately represent current scenic quality and visual sensitivity within the MPA.

The criteria for analysis was the number of acres proposed for designation under the Visual Resource Management (VRM) classes, and the level of impacts and surface disturbances permitted under each class. At the broad-scale level, analyses of the impacts on visual resources are discussed in terms of the number of acres in each VRM class because the proposed RMP management actions would be required to comply with (i.e., not exceed) the designated VRM class objectives within the MPA. For the fine-scale analysis, potential impacts from mineral development are discussed in terms of the number of acres of surface disturbance predicted within selected MPA visually sensitive areas.

The assumptions for analyzing the impacts to visual resources in the MPA are 1) that the greater the size and/or severity of surface disturbance and/or degree of air quality degradation, the greater the impact there would be to scenic quality, and 2) that all planning area resources with management actions that permit surface disturbances or degrade air quality would have adverse impacts on visual resources to some degree. Surface disturbances would introduce new visual elements onto the landscape or intensify existing visual elements, altering the line, form, color,

and/or texture that characterize the existing landscape. Changes in air quality, either from smoke, dust, haze, or other pollutants could potentially reduce or degrade scenic quality by obscuring distant views in the short-term and long-term. It should be noted, however, that the Clean Air Act sets limits on the allowable degradation of visibility within the adjacent national parks. Arches and Canyonlands National Parks have been designated as areas requiring the highest level of visibility (Prevention of Significant Deterioration [PSD] Class I), so smoke or haze that originates within the MPA cannot exceed the allowable NPS PSD I scenic quality standards for air pollutants.

4.3.18.1 Impacts Common to All Action Alternatives (B, C and D)

Actions that would designate utility corridors as VRM Class III within inventoried VRM Class II areas would have long-term, adverse impacts on visual resources within the MPA. These areas were inventoried as VRM Class II because of their high scenic quality and managing them under less-stringent VRM class objectives would allow surface-disturbance-related impacts that would eventually decrease the long-term visual aesthetics of the area.

Closed or No Surface Occupancy stipulations would be applied to all VRM Class I areas (see Tables VIS I and VIS II below), and VRM Class II-designated areas would have Controlled Surface Use leasing stipulations applied. These specific management actions would preserve and/or protect visual resources to the extent allowable under the VRM class objectives, with long-term, beneficial impacts on scenic quality in these areas.

4.3.18.2 Alternatives Impacts

Table 4.134 shows the proposed acres designated as each VRM class for all alternatives. The analysis logically assumes that areas designated as VRM Class III and VRM Class IV objectives would permit more surface-disturbing impacts and potentially have greater adverse impacts on visual resources and scenic quality than those areas designated as VRM Class I and II objectives. Table 4.135 illustrates the increase and decrease in VRM class acreages (as a percentage) within the MPA, compared to Alternative A. Note that Alternative A acreages are those designated through the VRM inventory process; Alternatives B, C, and D are VRM Class acreages.

Table 4.134. VRM Class Acreages by Alternative

VRM Class	Alternative A VRM Inventory	Alternative B Proposed Management Class	Alternative C Proposed Management Class	Alternative D Proposed Management Class
Class II	349,110	453,462	358,911	349,617
Class II	401,015	373,647	365,566	245,773
Class III	800,782	784,246	829,158	956,724
Class IV	271,356	210,532	268,133	269,641
Total	**1,822,263[1]**	**1,821,887**	**1,821,768**	**1,821,755**

Source: BLM GIS data 2003 and 2006.

[1]Acreage figures vary by alternative due to variances in GIS shapefiles.

Table 4.135. MPA VRM Acreage Designations (by percent)

VRM Class	Alternative A % of MPA	Alternative B	Alternative C	Alternative D
Class I	19	25 (6)[1]	20 (1)	19 (0)
Class II	22	20 (-2)	20 (-2)	14 (-8)
Class III	44	43 (-1)	45 (1)	52 (8)
Class IV	15	12 (-3)	15 (0)	15(0)

[1]The numbers in parentheses represent the percent increase or decrease, compared to Alternative A.

4.3.18.2.1 ALTERNATIVE A

Under Alternative A, the 2003 visual inventory determined that 349,110 acres would be assigned VRM Class I scenic values, 401,015 acres would be assigned VRM Class II scenic values, and 1,072,138 acres would be assigned scenic values of VRM Class III and VRM Class IV. The impacts on visual resources under this alternative would be negligible because Alternative A would manage scenic quality as determined by the MPA VRM inventory. An acreage comparison of Alternative A with proposed VRM acreages under each action alternative is shown below in Table 4.136. Conversely, areas that were inventoried at high levels of scenic quality and were managed under lower VRM Class objectives would, in the long-term, assume the characteristics of lower VRM Classes because surface disturbances and visual intrusions would be allowed to degrade visual/scenic quality in those areas. So, the long-term shifts in scenic quality within the MPA would be based on the proposed VRM Classes.

Table 4.136. Acreage Comparison of Action Alternatives' VRM Management Classes to Alternative A VRM Inventory Classes

	Alternative A	Alternative B	Alternative C	Alternative D
Class I	349,110	+104,352	+9,801	+507
Class II	401,015	-27,368	-35,449	-155,242
Class III	800,782	-16,536	+28,376	+155,942
Class IV	271,356	-60,824	-3,223	-1,715

4.3.18.2.2 ALTERNATIVE B

More acres (6%) within the MPA would be designated as VRM Class I under this alternative than under Alternative A, which would have more direct, long-term, beneficial impacts because more acreage would be protected at the highest degree of visual resource protection than indicated by the VRM inventory. Thus, this alternative would be the most protective of visual resources.

Under Alternative B, 266,485 acres of non-WSA lands with wilderness characteristics would be managed as VRM Class II. This would preclude surface disturbing activities that do not retain the characteristic landscape, and could impact all programs and activities.

4.3.18.2.3 ALTERNATIVE C

In the long-term, the designation of VRM classes under this alternative would result in more beneficial impacts to visual resources than Alternative A because more acres (1%) within the MPA would be managed to preserve pristine and/or relatively undeveloped high-quality scenic landscapes than indicated by the VRM inventory. However, more acres would be designated as Class VRM III and IV (1%), with long-term, adverse impacts on those areas inventoried as having high scenic quality, but managed at lower levels of scenic quality. Alternative C would, in the long-term, permit areas inventoried as having higher scenic quality to develop the characteristics of lower scenic quality areas because of permitted surface disturbances and visual intrusions, would be less protective of visual resources than Alternatives A or B.

Under Alternative C, 47,761 acres of non-WSA lands with wilderness characteristics would be managed as VRM Class II. This would preclude surface disturbing activities that do not retain the characteristic landscape, and could impact all programs and activities.

4.3.18.2.4 ALTERNATIVE D

Compared to the Alternative A VRM inventory, Alternative D would have more long-term, adverse impacts on visual resources because more acres (8%) would be managed at lower levels of scenic quality protection (VRM Class III and IV) than indicated by the VRM inventory. This would subject a higher percentage of the MPA to surface disturbing activities, and permit, in the long-term, areas with higher scenic quality to assume the characteristics of lower VRM Classes (III and IV). For this reason, Alternative D would manage the MPA with the least protection of visual resources.

4.3.18.3 VISUALLY SENSITIVE AREAS

Scenic and visually sensitive areas were selected within the MPA for analyses of impacts on visual resources. These visual analysis areas are Canyon Rims, Onion Creek, Fisher Towers, Richardson Amphitheater, the viewshed along the Colorado Riverway/Highway 128 from Dewey Bridge to the intersection of Highway 191, and public lands immediately adjoining Arches National Park. The analytical methodology of determining the impacts to these areas was a comparison of the VRM inventory with MPA management actions.

All of the visually sensitive areas discussed below are within either the Big Flat-Hatch Point or Eastern Paradox RFD Areas. The RFD predicted number of oil and gas wells for the 15-year life of the RMP and related surface disturbances are tabulated below in Table 4.137.

Table 4.137. The 15-year Oil and Gas Reasonably Foreseeable Development within the Big Flat-Hatch Point and Eastern Paradox RFD Areas

RFD Area	Alternative A	Alternative B	Alternative C	Alternative D
Big Flat-Hatch Point				
Number of wells predicted	46	19	34	44
15-year average surface disturbance (acres)	697	292	508	665
Eastern Paradox				
Number of wells predicted	34	21	28	32
15-year average surface disturbance (acres)	512	320	423	486

Source: BLM 2005f (RFD Scenario for the MPA)

4.3.18.3.1 Canyon Rims

4.3.18.3.1.1 Alternative A

Under Alternative A, the Canyon Rims SRMA was visually inventoried and is currently managed as VRM Class II (approximately 33,583 acres) along the western rim of the SRMA and the remainder of the area under VRM Class III objectives (67,943 acres). The western rim viewshed includes views along the Hatch Point escarpment that defines the boundary of the MPA, views into Lockhart Basin within the Monticello Field Office planning area, and views of the Island in the Sky and Needles Districts of Canyonlands National Park.

Management actions under this alternative would have visual resource-related impacts because the SRMA is open to minerals development with Controlled Surface Use leasing stipulations. If oil and gas exploration and/or other mineral resource development projects were conducted within the Canyon Rims SRMA, then areas managed under VRM Class III objectives would permit moderate short-term and long-term surface disturbances. The SRMA is a portion of the Big Flat-Hatch Point RFD area, which is projected to have an estimated 46 oil and natural gas exploration wells drilled resulting in an estimated 697 acres of surface disturbance during the 15-year life of the RMP.

Areas managed under VRM Class II objectives would require mitigation to reduce surface disturbances to a level that would not attract the attention of the casual viewer. Surface disturbance impacts in Canyon Rims, when viewed from Lockhart Basin within the Monticello Field Office planning area, would not likely be visible because the angle of view from the basin and the variation in elevation between the canyon rim and the basin would block views of surface disturbances. Surface disturbances in Canyon Rims might be visible from Canyonlands National Park, but site-specific visual analyses would be required to determine the level of impacts to visual resources. The impacts of minerals-related surface-disturbance from fugitive dust during well pad construction, access road construction, and minerals-related vehicle traffic on the Canyonlands National Park viewshed could adversely degrade visual quality, but dust-abatement mitigation would likely reduce this potential impact to a minor level, as required by the PSD standards mentioned in the introduction.

4.3.18.3.1.2 Alternative B

Under Alternative B, no acres within the Canyon Rims SRMA would be designated as VRM Class I, 40,450 acres would be designated as VRM Class II and 61,081 acres would be designated as VRM Class III. This is 6,867 more acres (7%) of VRM Class II than under Alternative A. The RFD for oil and gas development projects that 19 wells would be drilled during the 15-year life of the RMP in the Big Flat-Hatch Point RFD area, with approximately 292 acres of associated surface disturbance. The impacts to visual resources would be less than under Alternative A because a smaller area (approximately 41% of the area under Alternative A) would be subject to surface disturbances, and because more area would be protected under VRM Class II objectives.

4.3.18.3.1.3 Alternative C

Under this alternative, 33,515 acres within the Canyons Rims SRMA would be designated as Class VRM II (68 fewer acres than Alternative A) and 68,016 acres as VRM Class III. There would be no lands designated as VRM I. Alternative C would have less predicted surface disturbance than Alternative A, as 34 wells (508 acres of surface disturbance) would be developed under this alternative during the life of the RMP in comparison to 46 wells (697 acres of surface disturbance) under Alternative A. This is approximately 73% of the area predicted to be disturbed under Alternative A. Therefore, the potential impacts to scenic values under this alternative would be greater than Alternative B but less than Alternative A.

4.3.18.3.1.4 Alternative D

Alternative D would have the same reduction in acreage from VRM Class II to VRM Class III (with the same long-term impacts to scenic quality) and a predicted level of oil and gas-related surface disturbances very similar to that described for Alternative A (95% of the area under Alternative A). Consequently, this alternative would have a similar level of potential impacts to visual resources as Alternative A.

4.3.18.3.2 Onion Creek

4.3.18.3.2.1 Alternative A

Under Alternative A, the Onion Creek trail system has a VRM Class II inventory classification. The western portion of the creek and trail lies within the Richardson Amphitheater. Upstream, the creek narrows into a steep-walled, scenic canyon. The area is a popular non-mechanized recreation destination for equestrian users, as well as a popular destination for mountain bike and motorized users. Surface disturbance impacts to this area include RFD predictions of 34 natural gas and/or oil wells drilled during the 15-year life of the RMP within the Eastern Paradox RFD area, with short-term and long-term degradation of visual/scenic quality associated with surface disturbances of approximately 512 acres from well pads, access roads, and infrastructure. (The Onion Creek area is a small portion of the Eastern Paradox RFD area). The locations of well sites are presently unknown; however, the VRM Class II objectives would require mitigation to

reduce surface disturbances to a level that would not attract the attention of the casual viewer, so the impacts to visual resources would be minor.

4.3.18.3.2.2 Alternatives B

Under Alternative B Onion Creek, as part of the Richardson Amphitheater Focus Area for non-mechanized recreation, would be established, within the proposed Colorado Riverway SRMA. The Onion Creek area would be designated as VRM Classes I and II; impacts to visual resources would be less than those discussed under Alternative A because the VRM Class I affords a higher level of protection. The RFD for oil and gas would be less than under Alternative A: 21 wells under Alternative B, with surface disturbances totaling approximately 320 acres (62% of Alternative A) over the 15-year life of the RMP. Visual resource/scenic quality degradation would not occur because the VRM Class I and II designation for this area would be the more restrictive than the Alternative A/VRM inventory class designation for the area. Under Alternative B, designation of some portions of Onion Creek as VRM Class I would provide stronger levels of protection for visual resources than in any of the other alternatives.

4.3.18.3.2.3 Alternative C

Under Alternative C, Onion Creek would be designated as VRM Class II. Impacts to visual resources would be similar to those discussed under Alternative A. The RFD for oil and gas would be less than under Alternative A, 28 wells in Alternative C compared to 34 wells in Alternative A, with surface disturbances totally approximately 423 acres for Alternative C (83% of Alternative A). Visual resource/scenic quality degradation would not occur because the VRM Class II designation for this area would be the same as the Alternative A/VRM inventory class designation for the area.

4.3.18.3.2.4 Alternative D

Alternative D would have impacts similar to Alternative A because the level of RFD for oil and gas drilling in the Eastern Paradox RFD area would be very similar. The area would be designated as VRM Class II Management objectives (the same as Alternative B and C) with the same level of impacts as discussed under B and C. As discussed under Alternative B and C, scenic quality degradation would not occur because the VRM Class II designation and objective would remain the same as the Alternative A/VRM inventory.

4.3.18.3.3 Richardson Amphitheater/Fisher Towers

4.3.18.3.3.1 Alternative A

Under Alternative A, the Richardson Amphitheater and Fisher Towers areas were visually inventoried as VRM Class II. As discussed above for Onion Creek, the Richardson Amphitheatre is a relatively flat, broad, and open area adjacent to the Colorado Riverway, bounded on its eastern side by scenic red-rock cliffs. The area is a popular hiking destination. Similarly, Fisher Towers is a popular hiking trail (see Section 3.10.1.2.18) that rises out of Fisher Valley and provides unobstructed views of Richardson Amphitheatre to the south, the Colorado Riverway

and Arches National Park to the west, and views down into the Onion Creek Canyon from the eastern end of the trail. The RFD predicted level of surface disturbances from oil and gas development would be the same as discussed under Onion Creek because the area also lies within the Eastern Paradox RFD area. Impacts from surface disturbances within the Richardson Amphitheatre would be highly visible from the Fisher Towers trail because of the trail's elevated point of view. Surface disturbances to the west of the Colorado Riverway and adjacent to Arches National Park would potentially be visible from the trail, but site-specific visual analyses would be required to determine if visual mitigation could reduce visual contrasts to meet VRM class objectives. Minerals-related surface disturbances and fugitive dust production from minerals-related activities could have long-term, adverse impacts to the park viewshed, particular in areas open to minerals leasing adjacent to the park boundary, but site-specific analyses would be required to determine the level of impacts.

4.3.18.3.3.2 Alternatives B–D

Under Alternatives B, C, and D, the Colorado Riverway SRMA would be established, with VRM Class II Management objectives (except for areas of VRM Class I in Alternative B). The Richardson Amphitheater and Fisher Towers areas would be designated as recreation focus areas for non-mechanized recreation (hiking, backpacking, and equestrian use) under Alternatives B and C. Under Alternative D, the focus areas would not be established. The potential impacts from oil and gas RFD surface disturbances under these alternatives would be the same as discussed under Alternative A because the level of predicted minerals-related surface disturbances would be the same. Under all of the action alternatives, the impacts to the Richardson Amphitheater/Fisher Towers area from potential scenic quality degradation would be negligible to minor because the Colorado Riverway would continue to be designated as VRM Class II to protect scenic quality, which is the same level of protection as indicated by the Alternative A VRM inventory. Under Alternative B, designation of some portions (approximately 6,700 acres) of the Richardson Amphitheater as VRM Class I would provide stronger levels of protection for visual resources than in any of the other alternatives.

4.3.18.3.4 Highway 128/ Colorado Riverway

4.3.18.3.4.1 Alternative A

As discussed above for the Fisher Towers and Richardson Amphitheater, the Highway 128/Colorado Riverway recreation management area from Dewey Bridge to the intersection with Highway 191 was visually inventoried as VRM Class I (3,968 acres) and VRM Class II (13,761 acres. Visual impacts to the river corridor viewshed under Alternative A would potentially be similar to those discussed for the Richardson Amphitheater and Fisher Towers because the level of RFD predictions for minerals-related surface disturbances and visual intrusions from oil and gas exploration and development would be the same, and the topography of the areas are similar. Minerals-related activities and surface disturbances within the Richardson Amphitheater would likely be visible from the Riverway because of the relatively unobstructed view of the area from the Riverway.

4.3.18.3.4.2 Alternative B

Under Alternative B, the Colorado Riverway SRMA would be established and expanded. The river corridor would be designated as VRM Class I, VRM Class II, and VRM Class III, with initial management guidance provided by the current Colorado Riverway Recreation Management Plan. The impacts of this alternative would be to proportionally increase the areas designated as VRM Classes I, II, and III when compared to the Alternative A VRM inventory for the area: approximately 15 times more acres (58,950 acres total) would be designated as VRM Class I; two and a half times more acreage (a total of 33,615) designated as VRM Class II. The impacts would be to protect and enhance scenic quality in the long-term because more acreage would be protected for preservation of scenic quality than indicated by the VRM visual inventory for the Riverway. The impacts from minerals development would be less than the impacts discussed under Alternative A because the level of RFD for oil and natural gas development would be less.

4.3.18.3.4.3 Alternative C

The impacts on visual resources would be similar to Alternative B, but to a lesser degree, because fewer acres would be designated as VRM Class I and Class II when compared to the VRM inventory for the Riverway. Four times more acres would be designated as VRM Class I (16,639) and five times more acres would be designated as VRM Class II (67,655). In the long-term, the impacts on visual resources would be beneficial because more area would be protected and enhanced than indicated by the Alternative A/VRM inventory classes.

4.3.18.3.4.4 Alternative D

The impacts of this alternative on visual resources within the Riverway would be similar to Alternative B, but also to a lesser degree because fewer acres would be designated as VRM Class I and II when compared to the Alternative A VRM inventory. Under this alternative, two times more area (7,552 acres) would be designated as VRM Class I and three and a half times more area (50,551 acres) would be designated as VRM Class II. The impacts on visual resources would be beneficial in the long-term because, as discussed for the other action alternatives, more area would be protected from scenic quality degradation when compared to the VRM inventory for the area.

4.3.18.3.5 Public Lands Immediately Adjoining Arches National Park

Under all alternatives, the public lands immediately adjoining Arches National Park would be designated as VRM Class II to protect the views from critical key observation points within the park.

4.3.18.4 Summary of Impacts

Table 2.2 of Chapter 2 summarizes the impacts to visual resources in terms of acreages affected for each alternative.

4.3.19 WILDLIFE AND FISHERIES

This section discusses impacts to wildlife and fisheries from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning wildlife and fisheries are described in Chapter 3.

The table below summarizes the habitat types utilized by the representative wildlife species found in the MPA. These representative species were chosen for their high public interest, such as deer or elk, or because they represent an important ecological group, such as neotropical birds. The Wildlife and Fisheries section in Chapter 3 (Section 3.20) explains the connection between specific habitat types and associated wildlife in more detail. Most of the quantitative analyses in this section report impacts by habitat type, since there are too many wildlife species to address each one individually.

Table 4.138. Grouping of Wildlife Species by Habitat Type

Vegetation/ Habitat Type	Wildlife Associations
Aquatic	Amphibians, fish
Conifer / Mountain shrub	Mule deer, elk, mountain lion, black bear (primarily in old growth stands), neotropical birds, upland game birds, reptiles
Desert shrub	Pronghorn, desert bighorn sheep, elk (winter), raptors, neotropical birds, upland game birds, reptiles
Pinyon-juniper	Mule deer, elk, pronghorn, mountain lion, neotropical birds, upland game birds, reptiles
Riparian/ Wetland	Mule deer, elk, mountain lion, neotropical birds, upland game birds, amphibian and fish species, reptiles
Sagebrush/ Perennial grass	Mule deer, elk, Rocky Mountain bighorn sheep, mountain lion, neotropical birds, upland game birds, reptiles

The BLM has designated habitat within the MPA for mule deer, elk, pronghorn antelope, Rocky Mountain bighorn sheep, and desert bighorn sheep. Mule deer and elk habitats have been combined by the BLM in an attempt to simplify the management of their closely overlapping ranges. With the exception of Alternative A (see below), further discussions and analyses will consider the two species together. Where available and appropriate, BLM-designated habitats for particular species are used rather than vegetation types. The BLM-designated habitats proposed under Alternative B for each species are generally the largest. Alternative C generally recognizes less habitat for each species, and Alternative D the least.

The impacts analyses in this section are divided into impacts common to all alternatives (including Alternative A), impacts common to all action alternatives (Alternatives B, C, and D only), and impacts that vary by specific alternative. For each alternative, the total impacts include those specific to the alternative and those common to all alternatives (and all action alternatives where applicable). Therefore, the actions and impacts described under Alternatives B, C, and D include not only those actions and impacts unique to Alternatives B, C, or D, but

also those listed and discussed under, Impacts Common to All Alternatives and Impacts Common to All Action Alternatives.

Impacts to wildlife and their habitats will vary between alternatives by size, condition, and quality of those habitats and the degree to which those habitats can support viable populations.

Within habitats designated and managed for specific species, management prescriptions can be implemented that will benefit the target species as well as other wildlife species within the area. Increases in habitat size improve wildlife carrying capacity, thus benefiting wildlife. Within these habitats, management decisions from other resources could adversely impact wildlife

Development activities and human disturbances may alter or eliminate wildlife use, thus affecting the quality of wildlife habitats. By reducing human-related disturbances and conflicts in critical locations and during critical times of the year, the quality of the habitat may be protected and improved.

Surface disturbing activities and other decisions that affect the biotic conditions of the vegetation and soil also affect wildlife habitats. Biotic conditions affect forage production and quality, vegetative cover, vegetative composition and species diversity. Changes in these biotic conditions affect the condition and quality of wildlife habitats and may alter or eliminate wildlife use. By reducing surface disturbing activities and maintaining or improving biotic conditions, the condition and quality of the habitat may be protected and improved. The size of managed wildlife habitats, combined with the quality and condition of those habitats, will demonstrate impacts on those species.

Improving or maintaining the size, quality and condition of habitats would be beneficial to target and most non-target species, while decreasing size or degrading the quality or condition of those habitats would adversely impact most wildlife species.

4.3.19.1 Impacts of Resource Management Decisions with Negligable Impacts on Wildlife and Fisheries

Management decisions related to the following resources would have negligible impacts on wildlife resources, and are therefore not included in the analyses below: Air Quality, Cultural Resources, and Paleontological Resources. The impacts of management decisions for these resources would be negligible because maintaining air quality, protecting and inventorying cultural resources, and allowing recreational fossil collection and scientific study of fossil resources would 1) not improve or degrade wildlife and fish habitat or 2) cause the gain or loss of wildlife and fish habitat.

4.3.19.2 Impacts of Fire Management Decisions on Wildlife and Fisheries

The impacts of fire management on wildlife would be the same under all alternatives, with all use guided by the Utah Land Use Plan Amendment (LUP Amendment) for Fire and Fuels Management (BLM 2005c). Adherence with the LUP Amendment (which mandates the maintenance of existing healthy ecosystems and the protection of threatened, endangered, and

special status species) would have beneficial impacts on wildlife habitat in the MPA wherever wildlife habitat overlaps with that of protected special status species, and would ensure that healthy ecosystems are not adversely impacted by fire management and fuels reduction. Wildland fire use would not be authorized in the following areas unless reasonable Resource Protection Measures (RPMs) were in place: areas that are known to be highly susceptible to post-fire cheatgrass or other weed invasion, important terrestrial and aquatic habitats, and non-fire adapted vegetation communities. These RPMs would have beneficial impacts on wildlife habitat by reducing the spread of weeds and preserving native plant species, thereby maintaining suitable wildlife forage, cover, and habitat.

Fuels management actions include fuels-reduction treatments on 5,000 to 10,000 acres annually. These actions include: mechanical and manual treatments, prescribed fire, chemical or biological vegetation control, and aerial/ground seeding. These fuels management decisions would likely have a beneficial long-term impact on wildlife and fish populations by helping to restore the natural fire regime, which would improve habitat health (Lewis and Harshbarger 1976), forage, nesting opportunities, and cover. Restoring the natural fire regime would also reduce the chance of catastrophic fire, and the subsequent loss of major ecosystem components. In the short-term, vegetation treatments could result in trampling or removal of wildlife forage and/or habitat, and human-caused wildlife disturbance.

4.3.19.2.1 Terrestrial Species

Short-term adverse impacts from fire management actions include mortality, habitat destruction, and habitat displacement. These actions would likely affect habitat used by raptors, migratory birds, small mammals, amphibians, reptiles, and big game species. Direct impacts from wildfire suppression could include habitat corruption from fire retardant and aviation fuel, soil erosion from fireline construction on steep slopes, and damaged vegetation and soils from heavy equipment and fire camps.

The adverse impacts of fuels management actions include the short-term disturbance of wildlife habitat while it regenerates and the thinning and removal of ecologically desirable species. Short-term impacts of treatments would include the mortality of non-target plants due to herbicide use and from seeding methods that cause soil-surface disturbance. These actions could result in a reduction of native species diversity and consequently a reduction in wildlife habitat.

However, managed wildfire and prescribed burns provide long-term benefits to wildlife and wildlife habitat. Fire produces a varied mosaic of habitats and results in the regeneration of old and decadent vegetation, which can be favorable to big game. Fuel reduction treatments also reduce the risk of catastrophic fire, which otherwise could cause the long-term loss of wildlife habitat.

4.3.19.2.2 Aquatic and Amphibious Species

Adverse impacts to fish, amphibians, and other aquatic species would include an increased risk of contaminating water sources with fire retardant or vehicle fluids; soil erosion following surface-disturbing fire suppression measures; damage to riparian vegetation and soils by heavy

equipment; and reduced stream flow where water for fire suppression is drawn directly from streams and water bodies. Erosion would increase the sedimentation of surface waters, which affects water temperature, turbidity, and chemistry. These changes in water quality would generally have adverse impacts on aquatic species.

4.3.19.3 Impacts of Health and Safety Decisions on Wildlife and Fisheries

Health and safety decisions would have the same impacts on wildlife and fisheries under all alternatives. The primary impacts on wildlife and fisheries would result from the prioritization of abandoned mine lands (AMLs) for reclamation and mitigation.

Because abandoned mining structures are often used as roosting habitat by bat species, completely sealing off AML entrances during reclamation would have direct adverse impacts on roosting individuals and populations by displacing them from this habitat and reducing the availability of suitable roosting sites. Of the 18 bat species in Utah, 14 species regularly occur in abandoned mines (Grandison 2004). However, mines would be surveyed for bats prior to being sealed, and mitigation including the installation of bat-compatible mine gates and cupolas (which allow bats to pass through, but prohibit human entrance) would minimize the adverse impacts of mine closures on bats.

Some AML sites would be prioritized for reclamation due to hazardous waste contamination and water quality issues. These reclamations would have long-term beneficial impacts on fish, amphibians, and other aquatic species by improving water quality and reducing groundwater contamination.

4.3.19.4 Impacts of Lands and Realty Decisions on Wildlife and Fisheries

4.3.19.4.1 Impacts Common to All Alternatives

The following lands and realty decisions would impact wildlife and fisheries in the MPA: ROWs, easements, permits, utility/transportation systems, acquisitions and disposals, and withdrawals. Under all alternatives, Wilderness Study Areas (WSAs) would be exclusion areas for rights-of-way (ROWs), which would benefit wildlife by preventing the fragmentation of habitat in WSAs. However, all areas not identified as avoidance or exclusion areas would be available for ROWs and could be subject to multiple-uses and surface disturbances. The authorization of ROWs for utility and communication infrastructure (among others) could have direct, long-term, adverse impacts on wildlife due to habitat loss or fragmentation and human disturbance during construction activities.

The withdrawal of 78,333 acres from mineral entry within the MPA would be continued, thereby reducing or eliminating surface-disturbing activities and associated impacts to wildlife and their habitat. Under all alternatives, approximately 14,740 acres of land would be listed for potential disposal. This would include 12,470 acres of desert shrub, 1,794 acres of pinyon-juniper, 102 acres of riparian and wetland, and 208 acres of sagebrush/grassland habitats. Although disposals could lead to the loss of potential wildlife habitat, they could also lead to the beneficial acquisition of wildlife foraging habitat and relict vegetation areas as part of the exchange

program. Where possible, TES species habitat, quality riparian areas, and key productive ecosystems would be retained or acquired under all alternatives. This would allow for protection and management of these key wildlife habitat areas, prevent their fragmentation from adjoining parcels, and mitigate the adverse impacts of land disposals.

Surface-disturbing activities associated with authorizing ROWs, roads, and other development projects in the MPA would have the potential to adversely impact wildlife species and their habitats. The ROW utility corridor around Highway I-70 would vary in width across alternatives; regardless of width, surface-disturbing activities within the corridor would cause the long-term loss or degradation of wildlife habitat and avoidance of the area by wildlife. It could also provide increased predation of small prey species by raptors perching on utility poles, and potentially electrocution of some birds.

4.3.19.4.2 Impacts Common to All Action Alternatives (B, C and D)

Under Alternatives B and D, ACECs would be avoidance areas for ROWs. The impacts of ROWs are discussed above. Minimum Impact Criteria for filming permits would ensure that filming projects would not: impact Sensitive species habitat, use exotic species, adversely impact relict environments or riparian areas, utilize excessive numbers of livestock, or involve more than 15 vehicles and 75 people. These criteria would reduce human disturbance of wildlife and their habitat during filming.

All action alternatives would identify the entire MPA as available for wind or solar energy development in the MPA except in areas identified as closed or NSO for oil and gas leasing. These stipulations would preclude all other surface disturbing activities, including ROWs. Areas designated as NSO or closed include non-WSA lands with wilderness characteristics, WSAs, WSR corridors, ACECs, raptor habitat, and special status species habitat. These ROWs would have adverse impacts to wildlife similar to those described above, with the exception that wind energy development would adversely impact birds to a greater degree.

4.3.19.4.2.1 Alternative A

Under Alternative A, the impacts of lands and realty decisions on wildlife resources would be limited to those common to all alternatives. Under this alternative, the existing utility corridor would continue to disturb approximately 32,183 acres of habitat, primarily of desert shrub vegetation (Table 4.139) associated with pronghorn, desert bighorn sheep, elk (winter), raptors, neotropical birds, upland game birds, and reptiles (see Table 4.138).

4.3.19.4.2.2 Alternative B

Under Alternative B, an additional 100 ft would be added to each side of the existing utility corridor, resulting in a total of up to 64,539 acres of surface disturbance concentrated in desert shrub habitats. Impacts to rare riparian and wetland habitat would be almost double that of Alternative A, but would be mitigated by no surface occupancy stipulations for riparian areas.

Table 4.139. Acres of Surface Disturbance due to Utility Corridors by Major Habitat Type

Habitat Type	Associated Wildlife	Alternative A	Alternative B	Alternative C	Alternative D
Desert shrub	Pronghorn, desert bighorn sheep, elk (winter), raptors, neotropical birds, upland game birds, reptiles	25,144	52,053	113,917	141,797
Pinyon-juniper	Mule deer, elk, pronghorn, mountain lion, neotropical birds, upland game birds, reptiles	5,345	8,808	41,672	44,189
Riparian and wetland	Mule deer, elk, mountain lion, neotropical birds, upland game birds, amphibian and fish species, reptiles	143	323	1,031	1,139
Sagebrush and perennial grassland	Mule deer, elk, Rocky Mountain bighorn sheep, mountain lion, neotropical birds, upland game birds, reptiles	1,551	3,355	14,376	14,531
Total		**32,183**	**64,539**	**170,996**	**201,656**

Note: not every acre in a corridor would necessarily be disturbed.

Thus, impacts to riparian wildlife would primarily be caused by human disturbance, rather than physical disturbance of their habitat. Overall, Alternative B would disturb more than twice as much of most of the habitat types present as Alternative A.

4.3.19.4.2.3 Alternative C

Under Alternative C, the surface disturbance to wildlife-associated habitat types would total 170,996 acres, more than 2.5 times greater than under Alternative B and more than 5 times greater than Alternative A (Table 4.139).

4.3.19.4.2.4 Alternative D

Under Alternative D, the surface disturbance to wildlife-associated habitat types would total 201,656 acres, slightly greater than Alternative C, more than three times greater than under Alternative B, and more than six times greater than Alternative A (Table 4.139).

4.3.19.5 Impacts of Livestock Grazing Decisions on Wildlife and Fisheries

Livestock grazing can have both adverse and beneficial impacts on wildlife. If not properly managed through Standards for Rangeland Health and Guidelines for Grazing Management, harmful impacts to wildlife can include loss of biodiversity, lowering of population densities,

disruption of some ecosystem functions, change in community organization, and change in the physical characteristics of both terrestrial and aquatic habitats (Chaneton and Lavado 1996; Fleischner 1994; Olff and Ritchie 1998). Improper grazing can further increase salinity even in already saline soils (Chaneton and Lavado 1996), leading to inhibited plant diversity, especially in arid and relatively infertile soils (Olff and Ritchie 1998). Decreased plant diversity would have long-term adverse impacts on wildlife habitat. Many of the adverse impacts listed above occur when livestock are not carefully managed, and an overconcentration of animals causes excessive grazing and long-term disturbances. Carefully managed livestock grazing using Standards for Rangeland Health can potentially benefit some wildlife habitat by promoting regrowth of forage species, reducing the prevalence of some invasive plants, and creating openings and disturbed areas utilized by some species (GSRSC 2005: 116). Because of the level of management required for beneficial impacts to occur and the sensitivity of desert ecosystems, the following analyses assume that livestock grazing could potentially cause adverse impacts on wildlife species, except where active management intended to benefit wildlife is proposed.

4.3.19.5.1 Impacts Common to All Alternatives

Under all alternatives, livestock grazing would be managed according to the Guidelines for Grazing Management to achieve the Standards for Rangeland Health, which would benefit wildlife by maintaining or restoring the proper functioning condition (PFC) of riparian and wetland wildlife habitat, maintaining desired species (including native and non-native species) at a level appropriate to the site and conditions, and maintaining or improving aquatic habitat by ensuring that all state and Federal water quality standards are met. Additionally, the recommendations of the National Sage Grouse Habitat Conservation Strategy (BLM 2004c) and the Strategic Management Plan for Sage Grouse (UDWR 2002) would be followed where applicable. Sage-grouse management plans are generally beneficial for all sagebrush-associated species (see Table 4.138).

4.3.19.5.1.1 Mule Deer, Elk, Pronghorn

Management decisions common to all alternatives would exclude livestock grazing from certain allotments (including Between the Creek, North Sand Flats, South Sand Flats, and Castle Valley), directly benefiting big game by making more forage available. Vegetation treatments for rangeland improvement in pinyon-juniper habitat are proposed under all alternatives, including plowing and seeding, chaining and seeding, drill seeding, and prescribed fire and seeding. Vegetation treatments would benefit pronghorn, deer, and elk by improving the quality of their winter habitats.

4.3.19.5.1.2 Riparian Species

Livestock grazing in riparian areas could have adverse impacts on riparian-associated wildlife species (Table 4.138). Direct adverse impacts would include competition with wildlife for forage, and possible trampling of individual animals or nests. Indirect adverse impacts of livestock use of riparian areas include an increased susceptibility to invasion by noxious weeds, which reduces the value of forage, and reduction of cover species for sensitive wildlife (Popolizio et al. 1994; Kauffman et al. 1983; Sarr et al. 1996). Bird species that rely on native

riparian trees for nesting and roosting sites and protection from predators would be adversely affected by the replacement of native vegetation with introduced species (Saab et al. 1995).

4.3.19.5.1.3 Fishes, Amphibians, and Other Aquatic Species

Livestock-caused erosion in saline soils would contribute to increased salinity in the Colorado River and other surface waters in the MPA, which could modify species composition within an ecosystem (Galindo-Bect and Glenn 1999; Hart et al. 1998) and cause mortality of freshwater species (Nelson and Flickinger 1992). Sedimentation can also have similarly detrimental impacts. Soil compaction due to grazing in riparian areas would result in less rainwater infiltration into soils and more overland flow. The result would be large, short-lived flows rather than small, perennial flows (Trimble and Mendel 1995). This would reduce the duration of seasonal water availability for a wide range of wildlife species.

4.3.19.5.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, conversion of allotments from cattle to domestic sheep would not be considered in bighorn sheep habitat because of conflicts with bighorn sheep. This would have beneficial impacts to desert bighorn because it would maintain the separation of wild and domestic sheep, thereby reducing or eliminating the transmission of *Pasteurella*, which has been suspected as the cause of catastrophic bighorn die-offs (UDWR 1999).

4.3.19.5.2.1 Alternative A

Under Alternative A, livestock would be excluded from a total of 126,907 acres (including the Beaver Creek, Bogart, Cottonwood, Diamond, Pear Park and Spring Creek allotments), in addition to those mentioned under Common to All Alternatives. Alternative A would exclude livestock from the second greatest amount of wildlife habitat, and would therefore have the second greatest beneficial impacts on wildlife forage, habitat, and cover as described above.

<u>Mule Deer, Elk, Pronghorn, Bighorn Sheep</u>

The exclusion of livestock from the Bogart, Cottonwood, Diamond, Pear Park and Spring Creek allotments would have beneficial impacts, especially on mule deer and elk, because these allotments are in these two species' crucial winter range. Wintering deer and elk would not be forced to compete with livestock for sagebrush and early season grasses. Competition for forage, escape terrain, and thermal cover would not occur between livestock and deer and elk. Increased forage would lead to increased reproductive success for both deer and elk.

Alternative A would continue vegetation treatments on 67,125 acres. This would include mechanical treatments on 11 allotments (52,976 acres) and prescribed fire treatments on 14,149 acres. The increase in AUMs would be split evenly between livestock and wildlife where both are present. Wildlife species would benefit from additional AUMs available for their use, and all sagebrush-dependent species would benefit from expanded habitat as vegetation treatments would be used to restore sagebrush.

Riparian Species

Under Alternative A, grazing would continue to be excluded from riparian areas within five allotments: South Sand Flats, North Sand Flats, Between the Creeks, Cottonwood, and Diamond (no acreages available). This action would benefit riparian-associated wildlife species by protecting their habitat from soil compaction, erosion, and grazing of vulnerable plant species. Alternative A would exclude grazing in the fewest acres of riparian habitat, approximately 53% of the area excluded under Alternative B, 72% of that excluded under Alternative C, and 94% of that under Alternative D.

Fishes, Amphibians, and Other Aquatic Species

Under Alternative A, livestock grazing would continue to be adjusted in order to reduce salinity in the Colorado River drainage in seven allotments (Athena, Cisco, Cisco Mesa, Crescent Canyon, Highlands, Monument Wash, and Thompson Canyon). Grazing exclusions in riparian areas under Alternative A would also help to mitigate the adverse impacts of soil compaction and salinization in the Colorado River drainage.

4.3.19.5.2.2 Alternative B

Grazing would be excluded from a total of 153,797 acres (including Beaver Creek, Bogart, Cottonwood, Diamond, Pear Park, Professor Valley, Ida Gulch, River, Mill Creek and Spring Creek allotments), in addition to those mentioned under Common to All Alternatives. This is 26,890 acres more than proposed under Alternative A. Therefore, Alternative B would be more beneficial to wildlife species and their habitats than Alternative A.

Mule Deer, Elk, Pronghorn, Bighorn Sheep

The continued exclusion of livestock from the Bogart, Cottonwood, Diamond, Pear Park, Mill Creek and Spring Creek allotments would have beneficial impacts similar to those described under Alternative A, especially on mule deer and elk, because these allotments are in these species' crucial winter range.

Alternative B proposes 46,307 acres for vegetation treatments; 20,818 acres (35%) less than under Alternative A. Because the degree of indirect impacts depends upon the quality of the treatment and the success rate of re-vegetating, differences among the alternatives are difficult to quantify. However, it is reasonable to assume that fewer AUMs and/or less sagebrush habitat would be restored under Alternative B, and that big game species and other wildlife that depend on rangeland habitat would not benefit as much under Alternative B as under Alternative A.

Riparian Species

Under Alternative B, grazing would be excluded from 4,673 acres of riparian habitat in nine allotments. These exclusions would help mitigate the adverse impacts of livestock grazing in riparian areas discussed under Impacts Common to All Alternatives. Therefore, livestock management under Alternative B would be the most beneficial for riparian habitat and associated wildlife because more acres would be unavailable for livestock grazing.

Fishes, Amphibians, and Other Aquatic Species

Under Alternative B, grazing systems and Allotment Management Plans (AMPs) would be used on nine grazing allotments to minimize impacts to highly saline soils and reduce salinity in the Colorado River drainage. Aquatic species such as fish and amphibians would benefit from these AMPs with the subsequent reductions in turbidity and salinity and increased water availability. In addition, aquatic species would benefit from the continued exclusion of grazing from Cottonwood, Diamond and Bogart allotments.

4.3.19.5.2.3 Alternative C

Grazing would be excluded from a total of 114,234 acres (including Bogart, Cottonwood, Diamond, portions of Professor Valley, Ida Gulch, and River along Highway 128 and Mill Creek allotments), in addition to those mentioned under Common to All Alternatives. This is slightly less acres excluded from livestock grazing than under Alternatives A and B, and more than under Alternative D. Therefore, the impacts of these exclusions on wildlife would be very similar to Alternatives B and C, but more protective of wildlife than Alternative D.

Mule Deer, Elk, Pronghorn, Desert Bighorn Sheep

The exclusion of livestock from the Bogart, Cottonwood, Diamond, and Mill Creek allotments would have beneficial impacts especially on mule deer and elk, because these allotments are in these species' crucial winter range. These beneficial impacts include lack of competition with livestock for sagebrush and early season grasses, the elimination f competition for forage, escape terrain, and thermal cover, and increased reproductive success of deer and elk.

The impacts of vegetation treatments on big game would be the same as those discussed under Alternative B because the acreage proposed for treatment is similar.

Riparian Species

Under this alternative, grazing would be restricted in 1,169 acres of riparian habitat in five allotments. Restrictions would include the development of AMPs. In addition, 77 acres in Day Canyon would be unavailable for grazing. This alternative would protect more riparian wildlife habitat from the detrimental impacts of livestock grazing than Alternatives A and D, and less than Alternative B.

Fishes, Amphibians, and Other Aquatic Species

Alternative C would implement AMPs on more allotments than under Alternative B. Therefore, livestock management under Alternative C could increase salinity in soils and freshwater systems more than under Alternative B, and would have correspondingly greater impacts to fisheries and aquatic species. In addition, aquatic species would benefit from the continued exclusion of grazing from Cottonwood, Diamond and Bogart allotments.

4.3.19.5.2.4 Alternative D

Grazing would be excluded from a total of 52,214 acres under Alternative D. The only allotment excluded, other than those in Common to All Alternatives, would be Mill Creek. The impacts of these exclusions on wildlife, especially deer and elk, would be more adverse than under any of other alternatives. In addition, many of the allotments available in this alternative (including Bogart, Diamond, Cottonwood, and Pear Park) are largely inaccessible, making management of livestock, including distribution, difficult to implement and maintain. Difficulties with cattle distribution could lead to greater adverse impacts to wildlife, especially to big game animals.

Grazing would only be restricted as needed to mitigate conflicts with wildlife under Alternative D. This would result in more detrimental consequences for wildlife than under Alternatives B and C, because livestock-wildlife conflicts would not be avoided (as under Alternatives B and C).

Mule Deer, Elk, Pronghorn, Desert Bighorn Sheep

Cottonwood, Diamond, Bogart, Spring Creek, and Pear Park, all allotments in deer and elk crucial winter range, would be available for grazing (cattle only). This would mean that cattle would compete with deer and elk for forage in these allotments. As a result, there would be less forage for established deer and elk herds. The social intolerance of elk for cattle would lead to the rate of elk use decreasing on these crucial winter grounds. Competition for forage, escape terrain, and thermal cover would occur, leading to decreased reproductive success for deer and elk. This would result in a reduction in herd viability and a decrease in herd population.

The impacts of vegetation treatments on big game would be the same as those discussed under Alternative B because the same number of acres are proposed for treatment.

Riparian Species

The adverse impacts of livestock grazing decisions in riparian areas on wildlife species would be greater than discussed under Alternative A because while North Sand Flats, South Sand Flats, and Between the Creeks would continue to be unavailable for grazing, the riparian systems within the Bogart, Cottonwood and Diamond allotments would be available for livestock grazing. Because management in these allotments would be difficult due to their inaccessibility, needed riparian protections could not be implemented. This would result in watershed degradation in the headwaters of these large canyon systems, resulting in habitat loss.

Fishes, Amphibians, and Other Aquatic Species

The impacts of livestock grazing decisions on fish, amphibians, and other aquatic species would be the most adverse in Alternative D because the aquatic habitat in Bogart, Cottonwood and Diamond allotments would be available for grazing. Aquatic environments are rare in the MPA, and the species that they harbor are highly susceptible to environmental changes. Grazing would result in alteration of the aquatic habitat, which would result in habitat loss and species abandonment in the canyon systems within those allotments.

4.3.19.6 Impacts of Minerals Decisions on Wildlife and Fisheries

Impacts from minerals decisions on wildlife and their habitats would include habitat loss and degradation resulting from the removal of vegetation (surface disturbance) and subsequent occupation of areas for oil/gas well pads, open pit mines, and associated roads and infrastructure. Wildlife avoidance of disturbed and occupied areas would reduce their value as habitat. Many species of wildlife avoid areas with high or inconsistent levels of noise, roads with frequent automobile/truck traffic, areas that are heavily lit at night, and areas surrounding structures.

Adverse impacts of minerals decisions on wildlife resources would be reduced by the implementation of BMPs outlined in Section 2.1 and Appendix O. Restrictions include no surface disturbing activities within riparian habitat, required revegetation of oil and gas well sites upon project completion, and land management that meets or moves toward meeting Utah's Standards for Rangeland Health. In addition, the implementation of BMPs for the benefit of wildlife and their habitats (e.g., centralization of drill rigs and storage tanks, reduction of the number of access roads, and interim and final reclamation practices) would also reduce some of the short- and long-term adverse impacts listed above. Interim reclamation occurs during the operational phase of a project and consists of revegetating all areas surrounding wells and roads that are not actively used during oil or gas production. Final reclamation occurs when a well has been decommissioned and includes the practices of recontouring soil surfaces to match surrounding landforms, replacing topsoil, and reseeding with native plant species. The number of years required for successful final reclamation would depend on the habitat type; grasslands recover more quickly than sagebrush or desert shrub, which recover more quickly than forested areas such as pinyon-juniper or conifer habitat. A commonly used average value and goal for reclamation across the project area is 10 years. Following the successful reclamation of a well site or road, the long-term adverse impacts to wildlife species would be largely eliminated.

The amount of land that is open to oil and gas leasing or other mineral use is not necessarily indicative of the number of acres that would be directly disturbed. Areas managed under Standard or Timing and/or Controlled Surface Use stipulations allow minerals development, but not all of those acres would be subjected to surface disturbance. Habitat quality may be preserved by the implementation of seasonal restrictions and spatial buffers that protect crucial habitats. Areas categorized as NSO or Closed preclude all surface-disturbing minerals development and therefore improve the quality and condition of wildlife habitats. Riparian and wetland habitat, lands with a slope greater than 30%, and VRM Class I areas have been excluded from analysis because they have been assigned the leasing category of NSO, which precludes them from all surface disturbance.

The impacts of minerals decisions are analyzed for the entire MPA rather than for each individual RFD area for the purposes of comparison. Impacts may be concentrated in particular RFD areas, however. Depending on the distribution of wildlife habitat across particular RFD areas with high levels of disturbance, the amount of particular habitats disturbed may not match the composition of vegetation in the MPA. The Bookcliffs and Greater Cisco RFDs are projected to experience the greatest minerals development-related disturbances, and therefore impacts to wildlife and their habitat. The Bookcliffs RFD contains predominantly pinyon-juniper habitat with conifer/mountain shrub habitat as the second most common habitat. Greater Cisco is dominated by desert shrub followed by pinyon-juniper.

Of the seven oil and gas development areas within the MPA, wildlife habitat in the Greater Cisco RFD area is expected to be most heavily impacted by minerals decisions because it has the highest predicted levels of oil and gas well development (almost 45% of the 451 wells in the MPA would likely be sited in the Greater Cisco RFD). Site-specific analysis would be necessary to determine the exact impacts to wildlife from oil and gas development. Appendix S, Wildlife Impacts by RFD Area provides the estimated number of acres of disturbance in each wildlife habitat type under all alternatives given the assumption that disturbance would occur proportionally to the vegetation distribution within each RFD.

4.3.19.6.1 ALTERNATIVE A

4.3.19.6.1.1 Leasable Minerals

Surface disturbance and human-caused disturbance (noise, night-lighting, increased automobile traffic, and habitat fragmentation and loss) associated with well, pipeline, and road construction would result in both short- and long-term adverse impacts on wildlife. Surface disturbance would result in loss of habitat and would increase the potential for invasion of undesirable plant species, including noxious weeds (Piemeisel 1951). This loss of native vegetation would result in long-term adverse impacts on wildlife by decreasing the amount of available habitat and degrading existing habitat.

Wildlife species that use pinyon-juniper and desert shrub habitats would be the most heavily impacted by surface disturbance and related impacts due to oil and gas development (Table 4.140) because these are the predominant habitat types in the areas most likely to be developed. Human occupancy and activities would cause the adverse displacement of wildlife.

Under Alternative A, approximately 277,678 acres of pinyon-juniper habitat would be managed as either NSO or Closed, while approximately 41,086 acres of desert shrub would be managed under the same designations. A total of 389,633 acres (of all habitat types) would be managed as NSO or Closed.

Table 4.140. Estimated Surface Disturbance (in acres) for Oil and Gas Well Development, by Vegetation (Wildlife Habitat) Type

Habitat Type	Associated Wildlife	Alternative A	Alternative B	Alternative C	Alternative D
Conifer and Mountain Shrub	Mule deer, elk, mountain lion, black bear (primarily in old growth stands), neotropical birds, upland game birds, reptiles	267	157	256	266
Desert Shrub	Pronghorn, desert bighorn sheep, elk (winter), raptors, neotropical birds, upland game birds, reptiles	2,829	1,656	2,708	2,815
Pinyon-Juniper	Mule deer, elk, pronghorn, mountain lion, neotropical birds, upland game birds, reptiles	2,801	1,639	2,682	2,788

Table 4.140. Estimated Surface Disturbance (in acres) for Oil and Gas Well Development, by Vegetation (Wildlife Habitat) Type

Habitat Type	Associated Wildlife	Alternative A	Alternative B	Alternative C	Alternative D
Sagebrush/ Perennial Grassland	Mule deer, elk, Rocky Mountain bighorn sheep, mountain lion, neotropical birds, upland game birds, reptiles	488	285	467	485
Total Acres of Disturbance		**5987**	**3,737**	**6,113**	**6,354**

Mule Deer and Elk: Under Alternative A, the BLM would not specifically manage habitat for elk. Out of a total of 79,361 acres of designated mule deer crucial habitat under Alternative A, 30,259 acres (38%) would be managed as either NSO or Closed (Table 4.141). These leasing categories would preclude new surface disturbance, resulting in beneficial protections in these areas to mule deer and other wildlife species that occur within designated mule deer crucial habitat.

Table 4.141. Acres of Big Game Crucial Habitat Open and Closed to Surface Disturbance in the MPA by Alternative

Big Game Species	Alternative A		Alternative B		Alternative C		Alternative D	
	Open*	Closed**	Open	Closed	Open	Closed	Open	Closed
Mule Deer and Elk	49,103	30,259 (38%)	241,518	393,477 (62%)	234,960	114,663 (33%)	264,831	84,844 (24%)
Pronghorn	25,367	0 (0%)	469,781	351,919 (43%)	291,902	1,822 (<1%)	291,915	1,822 (<1%)
Desert Bighorn Sheep	314,346 (95%)	16,546 (5%)	200,636 (59%)	130,256 (41%)	230,640 (70%)	100,252 (30%)	320,498 (96%)	10,394 (4%)
Rocky Mountain Bighorn Sheep	25,857	151,750 (85%)	65,837	364,064 (85%)	48,057	257,047 (84%)	33,358	161,201 (83%)

*"Open" includes Standard and CST lease categories.

**"Closed" includes NSO and Closed leasing categories. The percent of the total designated habitat closed is listed in parentheses.

Pronghorn: Of a total of 25,367 acres of designated pronghorn crucial habitat under Alternative A, no land would be managed as either NSO or Closed (Table 4.141). The entire designated habitat would be managed under controlled surface and timing stipulations (CST), which would allow leasable mineral entry with special protections for wildlife relating to the timing of construction and operation. Pronghorn and other wildlife that use their habitat would benefit from the restriction on leasable minerals development in these areas, but not as much as if the lands were managed as NSO or Closed.

Desert Bighorn: Of a total of approximately 330,892 acres of designated desert bighorn crucial habitat under Alternative A, 16,546 acres (30%) would be managed as either NSO or Closed (Table 4.141), resulting in beneficial protections in those areas to desert bighorn and other wildlife species that occur within designated desert bighorn crucial habitat.

Rocky Mountain Bighorn: Of a total of 177,607 acres of designated Rocky Mountain bighorn crucial habitat under Alternative A, 151,750 acres (85%) would be managed as either NSO or Closed (Table 4.141) resulting in beneficial protections in those areas to Rocky Mountain bighorn and other wildlife species that occur within designated Rocky Mountain bighorn crucial habitat.

4.3.19.6.1.2 Geophysical Activity

Under Alternative A, approximately 2,261 acres of wildlife habitat would be temporarily impacted by geophysical exploration over the life of the RMP (Table 4.142). Impacts to wildlife habitat associated with exploration would include short-term impacts such as noise and disturbance from people working in the area and long-term impacts such as the loss of vegetation and potential spread of invasive and weedy plant species within the areas directly disturbed by geophysical exploration.

Table 4.142. Estimated Surface Disturbance (in Acres) on BLM Lands Associated with Geophysical Exploration by Vegetation Type

Habitat Types	Associated Wildlife	Alternative A	Alternative B	Alternative C	Alternative D
Conifer and Mountain Shrub	Mule deer, elk, mountain lion, black bear (primarily in old growth stands), neotropical birds, upland game birds, reptiles	95	55	82	92
Desert Shrub	Pronghorn, desert bighorn sheep, elk (winter), raptors, neotropical birds, upland game birds, reptiles	1001	587	866	973
Pinyon-Juniper	Mule deer, elk, pronghorn, mountain lion, neotropical birds, upland game birds, reptiles	992	581	857	963
Sagebrush/ Perennial Grasslands	Mule deer, elk, Rocky Mountain bighorn sheep, mountain lion, neotropical birds, upland game birds, reptiles	173	101	149	168
Total Acres of Disturbance		**2,261**	**1,324**	**1,954**	**2,196**

4.3.19.6.1.3 Salable Minerals

The exploration and development of salable minerals would have similar impacts to wildlife as other development described above. Under Alternative A, 1,467,768 acres of land in the MPA would be available for disposal of mineral materials. That is approximately 57% of the 1,821,374 acres in the MPA. However, the amount of expected salable development is low under all alternatives (up to 27 acres of disturbance per year), so Alternative A would not likely have much impact on wildlife.

4.3.19.6.1.4 Locatable Minerals

Under Alternative A, all public lands within the MPA would remain open to mining except within existing withdrawals. About 1,389,531 acres would be open to locatable minerals. Impacts resulting from locatable mineral exploration and development include habitat disturbance and fragmentation as described under Leasable Minerals, including direct loss of habitat, loss of forage, and disruption of migration routes. In addition, indirect impacts on individual animals related to the presence of roads, traffic, and human presence would occur. See discussions of impacts of minerals development to wildlife at the beginning of this section for more detail. However, the amount of expected locatable mineral development is low under all alternatives (up to 25 acres of disturbance per year), so Alternative A would not likely have much impact on wildlife.

4.3.19.6.2 Alternative B

Under Alternative B, the impacts of minerals decisions on wildlife resources would be of the same nature as those discussed under Alternative A, but would vary in the acreage over which those decisions would impact wildlife and wildlife habitat, as described below.

4.3.19.6.2.1 Leasable Minerals

Under Alternative B, approximately 3,737 acres of wildlife habitat disturbance due to oil and gas development would be expected, or approximately 2,809 acres (41%) fewer than under Alternative A (see Table 4.140). Because less surface disturbance would occur under Alternative B than under any other alternative (see Table 4.140), Alternative B would result in fewer oil- and gas-related impacts to wildlife than Alternative A.

As under all alternatives, the greatest surface disturbance, and therefore the greatest impact to wildlife, is expected in the Greater Cisco and the Bookcliffs RFD areas.

Impacts of oil and gas leasing on wildlife species and their habitats under Alternative B would be similar to those under Alternative A, with the following exceptions. Under Alternative B, approximately 535,373 acres of pinyon-juniper habitat would be managed as either NSO or Closed, while approximately 337,807 acres of desert shrub would be managed under the same leasing category. The total number of acres (of all habitat types) to be managed as NSO or Closed approximate 996,175 under Alternative B. Compared to Alternative A, Alternative B would manage approximately 2.5 times the total number of acres for management as NSO or

Closed. Overall, wildlife species in desert shrub and pinyon-juniper habitats would benefit more from the impacts of NSO or Closed leasing categories under Alternative B than Alternative A.

Mule Deer and Elk: Of approximately 634,995 acres designated as mule deer crucial habitat under Alternative B, 393,477 acres (62%) would be managed as either NSO or Closed (see Table 4.141). More habitat would be managed as Closed under Alternative B than Alternative A. Alternative B designates seven times more crucial habitat for mule deer and elk than Alternative A designates. An increase in the acreage of designated habitat along with an increase in the percent of acres managed as Closed or NSO for mule deer and elk would directly benefit these species and other wildlife in the MPA by decreasing impacts related to surface disturbance (as described above). Alternative B would have considerably more beneficial impacts to deer and elk than any other alternative.

Pronghorn: Of approximately 821,700 acres designated as pronghorn crucial habitat under Alternative B, 351,919 acres (43%) would be managed as either NSO or Closed (see Table 4.141). Approximately 41% more habitat would be managed as NSO or Closed under Alternative B than Alternative A. Alternative B would designate approximately 32 times more crucial habitat for mule deer and elk than Alternative A. Therefore, Alternative B would have far more beneficial impacts to pronghorn than any other alternative.

Desert Bighorn: Of approximately 330,892 total acres of habitat, 130,256 acres would be managed as either NSO or Closed (see Table 4.141). More habitat would be managed as Closed under Alternative B than Alternative A. Alternative B designates 2.3 times more crucial habitat for desert bighorn than Alternative A designates. Therefore, Alternative B would have far more beneficial impacts to desert bighorn than Alternatives A and D, and similar impacts to Alternative C.

Rocky Mountain Bighorn: Of approximately 429,901 acres designated as Rocky Mountain bighorn crucial habitat under Alternative B, 364,064 acres (85%) would be managed as either NSO or Closed (see Table 4.141). This is the same percentage that Alternative A would manage as closed, but includes a much greater number of acres. Alternative B would designate 2.4 times more crucial habitat for pronghorn than Alternative A. Therefore, Alternative B would have more beneficial impacts to Rocky Mountain bighorn than any other alternative.

4.3.19.6.2.2 Geophysical Activity

Under Alternative B, there would be approximately 1,324 acres of surface disturbance to wildlife habitat associated with geophysical exploration. This is approximately 41% fewer acres of disturbance than would be expected under Alternative A; therefore, Alternative B would result in a smaller overall impact.

4.3.19.6.2.3 Salable Minerals

Under Alternative B, 808,097 acres would be open to disposal of salable minerals under standard or controlled surface use and timing limitation stipulations. Thus, the alternative would allow disposal on 658,970 fewer acres than under Alternative A. No disposals would be allowed in

NSO or closed areas on 1,014,643 acres. Overall, less land would be open to disposal of salable minerals under Alternative B than Alternative A; these limitations would benefit wildlife species by preventing surface-disturbing activities and associated human impacts over larger habitat areas.

4.3.19.6.2.4 Locatable Minerals

Alternative B would manage 268,873 acres as open to locatable mineral entry under standard stipulations, and restrict 1,120,658 acres to controlled surface and timing limitation stipulations. For comparison, Alternative A would manage all open lands (1,389,531 acres) under standard stipulations. Under Alternative B, 79% of open lands would be managed under special stipulations. Due to this increased acreage managed with timing and/or surface restrictions on development, Alternative B would be more beneficial for wildlife species and their habitats than Alternative A.

4.3.19.6.3 Alternative C

Under Alternative C, the qualitative impacts of minerals decisions on wildlife resources would be similar to those discussed under Alternative A. However, the level of that impact would be different based on the acreages open to oil and gas leasing and mineral entry (more information is found in Appendix T, Vegetation).

4.3.19.6.3.1 Leasable Minerals

Under Alternative C, approximately 6,113 acres of wildlife habitat disturbance due to oil and gas development would be expected, or approximately 272 acres (4%) fewer than expected under Alternative A (see Table 4.140). More acres would be disturbed under Alternative C than Alternative B.

Impacts of oil and gas leasing on wildlife species and their habitats under Alternative C would be similar to those under Alternatives A and B, with the following exceptions. Under Alternative C, approximately 394,087 acres of pinyon-juniper habitat would be managed as either NSO or Closed, while approximately 109,356 acres of desert shrub would be managed under the same designations. Approximately 586,437 acres (of all habitat types) would be managed as NSO or Closed under Alternative C. Alternative C would designate approximately 196,804 more acres for management under NSO and Closed designations than Alternative A, but 381,362 fewer acres than Alternative B. Wildlife species in all habitat types (especially in pinyon-juniper and desert shrub) would experience more beneficial impacts related to oil and gas lease designations under Alternative C than under Alternative A, but fewer than under Alternative B.

Mule Deer and Elk: Of approximately 349,623 acres designated as mule deer and elk crucial habitat under Alternative C, 114,663 (33%) acres would be managed as either NSO or Closed (see Table 4.141). Alternative C would set aside a smaller percentage of designated crucial habitat as NSO or Closed than Alternative A (38%) or Alternative B (61%). However, Alternative C would close more acres than Alternative A (30,259), but fewer than Alternative B

(387,563). Alternative C would designate 4.4 times more total crucial habitat for mule deer and elk than Alternative A would designate.

Pronghorn: Of approximately 293,724 acres designated as pronghorn crucial habitat under Alternative C, 1,822 (<1%) acres would be managed as either NSO or Closed (see Table 4.141). Alternative C would set aside a slightly higher percentage of designated crucial habitat as NSO or Closed than Alternative A (0%), but a smaller percentage than Alternative B (41%). Alternative C would designate 11.6 times more total crucial habitat for pronghorn than Alternative A. Overall, Alternative C would be more beneficial for pronghorn than Alternative A, though not as beneficial as Alternative B.

Desert Bighorn: Of 330,892 acres designated as desert bighorn crucial habitat under Alternative C, 100,252 (98%) acres would be managed as either NSO or Closed. This would be a larger percentage closed than Alternative A (30%) but less than Alternative B (100%) (see Table 4.141). Alternative C would designate 1.8 times more total crucial habitat for desert bighorn than Alternative A. Overall, Alternative C would be far more beneficial for desert bighorn than Alternative A, though not as beneficial as Alternative B.

Rocky Mountain Bighorn: Of approximately 305,105 acres designated as Rocky Mountain bighorn crucial habitat under Alternative C, 257,047 acres would be managed as either NSO or Closed (see Table 4.141). Alternative C would close a slightly smaller percentage of designated Rocky Mountain bighorn habitat to oil and gas activities than Alternatives A or B. However, when total acreages are considered, Alternative C would close more total acres than Alternative A but fewer than Alternative B. Alternative C designates 1.7 times more total crucial habitat for Rocky Mountain bighorn than Alternative A designates. Overall, Alternative C would be much more beneficial for Rocky Mountain bighorn than Alternative A, though not as beneficial as Alternative B.

4.3.19.6.3.2 Geophysical Activity

Under Alternative C, there would be approximately 1,954 acres of surface disturbance to wildlife habitat associated with geophysical exploration, or approximately 14% fewer acres of disturbance than under Alternative A and 47% more than under Alternative B. Therefore, Alternative C would result in fewer adverse impacts from geophysical exploration to wildlife than Alternative A, but more adverse impacts than Alternative B.

4.3.19.6.3.3 Salable Minerals

Under Alternative C, 1,234,267 acres would be open to disposal under standard, CSU, or TL stipulations. Thus, the alternative would allow disposal on 233,501 fewer acres than under Alternative A and 684,531 more acres than under Alternative B. No disposals would be allowed in NSO or closed areas on 587,730 acres. The beneficial impacts of these limitations on wildlife are discussed under Alternative B, above.

4.3.19.6.3.4 Locatable Minerals

Alternative C would designate 427,466 acres as open to locatable mineral entry under standard stipulations, and restrict 946,203 acres to controlled surface and timing limitation stipulations. For comparison, Alternative A would manage all open lands (1,389,531 acres) under standard stipulations. Under Alternative C, 68% of open lands would be managed under special stipulations. Due to this increased acreage managed with and/or surface restrictions on development, Alternative C would be more beneficial for wildlife species and their habitats than Alternative A, though less beneficial than Alternative B, which would manage 79% of lands under special conditions.

4.3.19.6.4 Alternative D

4.3.19.6.4.1 Leasable Minerals

Under Alternative D, approximately 367 more acres (<1%) of oil- and gas-related surface disturbance (see Table 4.140) would occur, as compared to Alternative A. Overall, Alternative D would include slightly more oil- and gas-related adverse impacts to wildlife than would Alternative A, since more surface disturbance translates to less intact habitat, more roads, and a higher level of human presence. Alternative D would provide less protection from disturbance than either Alternatives B or C.

Under Alternative D, approximately 226,524 acres of pinyon-juniper habitat would be managed as either NSO or Closed, while approximately 57,892 acres of desert shrub would be managed under the same designations. Approximately 357,716 acres (of all habitat types) would be managed as NSO or Closed under Alternative D. Alternative D would designate approximately 31,917 fewer acres for management under NSO and Closed designations than Alternative A, 610,083 fewer acres than Alternative B, and 228,721 fewer acres than Alternative C. Alternative D would be the least beneficial to wildlife because it would set aside the fewest number of acres as NSO or Closed to oil and gas leasing.

Mule Deer and Elk: Of 349,675 acres designated as mule deer and elk crucial habitat under Alternative D, 84,844 (24%) acres would be managed as either NSO or Closed (see Table 4.141). Alternative D would set aside the smallest percentage of designated crucial habitat as NSO or Closed (see Table 4.141) but would close more acres than Alternative A (though fewer than B or C). Alternative D would designate 4.4 times more total crucial habitat for mule deer and elk than Alternative A, and less total habitat than Alternatives B or C. Overall, Alternative D would be more beneficial for wildlife than Alternative A, though not as beneficial as Alternatives B or C.

Pronghorn: Of 293,737 acres designated as pronghorn crucial habitat under Alternative D, 1,822 (<1%) acres would be managed as either NSO or Closed (see Table 4.141). This is more acres than Alternative A, fewer than Alternative B, and the same number as Alternative C (Table 4.130). Overall, Alternative D would be more beneficial for pronghorn than Alternative A, though not as beneficial as Alternative B.

Desert Bighorn: Of 330,832 acres designated as desert bighorn crucial habitat under Alternative D, 10,394 acres would be managed as either NSO or Closed. This represents slightly fewer closed acres than under Alternative A, and considerably fewer than under Alternatives B or C (see Table 4.141). Alternative D designates only 83% as much crucial habitat for desert bighorn than Alternative A designates. Overall, Alternative D would be less beneficial for desert bighorn than Alternatives A, B, or C.

Rocky Mountain Bighorn: Of 194,559 acres designated as Rocky Mountain bighorn crucial habitat under Alternative D, 161,201 acres (83%) would be managed as either NSO or Closed. This represents more acres of closed areas than would be managed under Alternative A, but fewer than Alternatives B or C (see Table 4.141). Alternative D designates 1.1 times more total crucial habitat for Rocky Mountain bighorn than Alternative A designates. Overall, Alternative D would be more beneficial for Rocky Mountain bighorn than Alternative A, though not as beneficial as Alternatives B or C.

4.3.19.6.4.2 Geophysical Activity

Under Alternative D, there would be approximately 2,196 acres of surface disturbance to wildlife habitat associated with geophysical exploration, or approximately 3% fewer acres of disturbance than under Alternative A, 66% more than under Alternative B, and 12% more than under Alternative C. Therefore, Alternative D would likely result in larger adverse impacts than Alternatives B or C, but slightly fewer adverse impacts than under Alternative A.

4.3.19.6.4.3 Salable Minerals

Under Alternative D, 1,387,473 acres would be open to disposal under standard, CSU, or TL stipulations. Thus, the alternative would allow disposal on 80,295 fewer acres than under Alternative A. No disposals would be allowed in NSO or closed areas on 434,991 acres. Therefore, Alternative D would have the greatest adverse impacts to wildlife due to the disposal of salable minerals.

4.3.19.6.4.4 Locatable Minerals

Alternative D would designate 797,031 acres of land in the MPA as open to locatable mineral entry under standard stipulations, and restrict 592,500 acres to controlled surface and timing regulations. For comparison, Alternative A would manage all open lands (1,389,531 acres) under standard stipulations. Though all alternatives would manage for the same number of open lands, Alternatives B, C, and D would manage varying percentages of that land under controlled surface and timing use stipulations. Under Alternative D, 43% of open lands would be managed under special stipulations. Therefore, Alternative D would be more beneficial for wildlife species and their habitats than Alternative A, though less beneficial than Alternatives B or C, which would manage 79% and 68% of lands under special conditions, respectively.

4.3.19.7 Impacts of Non-WSA Lands with Wilderness Characteristics Decisions on Wildlife and Fisheries

Managing non-WSA land to maintain wilderness characteristics would generally benefit wildlife by reducing habitat degradation and fragmentation. The management of these areas would prohibit surface disturbing activities in areas managed as NSO or closed. Management of non-WSA lands with wilderness characteristics includes limiting vehicles to designated roads, and excluding or avoiding new ROWs.

4.3.19.7.1 Alternative A

Alternative A would not implement any specific wilderness characteristics decisions that would affect wildlife. This would have an adverse impact on wildlife as habitat fragmentation due to surface disturbing activities would be more likely to occur.

4.3.19.7.2 Alternative B

Alternative B would manage 266,485 acres of non-WSA lands to maintain wilderness characteristics, and would have the greatest beneficial impacts on wildlife because habitat fragmentation would be less likely to occur on this acreage, since surface disturbing activities would be precluded.

However, protection of wilderness characteristics could preclude fencing and enclosures in Granite Creek, new water installations to benefit pronghorn habitat in Hatch Wash, Harts Point, Floy Canyon and Coal Canyon, new water facilities for bighorn sheep in Labyrinth Canyon, Shafer Canyon, Gooseneck, Goldbar, Horsethief Point, Dead Horse Cliffs, and Hatch/Lockhart, and could preclude mechanical vegetation treatments for elk forage within Big Triangle, Westwater Canyon, Hells Hole, Hideout Canyon, Mexico Point, Westwater Creek, Flume Canyon, Coal Canyon, Floy Canyon, and Desolation Canyon. Any of these new projects, if mitigated appropriately, could be permitted within these areas.

4.3.19.7.3 Alternative C

Alternative C would manage 47,761 acres of non-WSA lands to maintain wilderness characteristics, and would have more beneficial impacts on wildlife than Alternatives A or D, but less beneficial impacts than Alternative B. Habitat fragmentation would be less likely to occur on this acreage, which is less than the acreage protected under Alternative C.

4.3.19.7.4 Alternative D

No non-WSA lands would be managed to maintain wilderness characteristics, so no beneficial impacts to wildlife would occur, and some adverse impacts may occur due to increased surface disturbance resulting in habitat fragmentation.

4.3.19.8 Impacts of Recreation Decisions on Wildlife and Fisheries

The primary impacts of recreation on wildlife would include surface disturbance of wildlife habitat by vehicles and non-motorized recreationists, habitat fragmentation by motorized vehicle use, the introduction and spread of noxious weeds, and direct mortality through wildlife collisions with motor vehicles and crushing of eggs or nests. In addition, many wildlife species (birds in particular) are sensitive to traffic and other human-caused noise. Traffic noise has been shown to directly interfere with bird vocal communication, which affects territorial behavior and mating success (Reijnen and Foppen 1994). Increased road traffic also increases the risk of direct mortality of wildlife species due to vehicle impacts; carrion-eating raptors and mule deer attempting to cross roads are especially vulnerable. Where designated, Special Recreation Management Areas (SRMAs) would reduce adverse impacts on wildlife by restricting recreation or reducing dispersed recreational activities, and would therefore have beneficial impacts on wildlife in the area.

The adverse impacts of recreation decisions would be partially mitigated by the required reclamation of disturbed areas to meet the Utah Standards for Public Land Health and Guidelines for Recreation Management and protective measures outlined for Federally-listed species under Impacts Common to All Alternatives. In addition, carefully recreation management through actions such as group size permits and non-motorized focus areas (see below for more details) would help to mitigate some impacts.

4.3.19.8.1 Impacts Common to All Alternatives

Under all alternatives, the BLM would consider and, where appropriate, implement management methods to protect riparian resources and wildlife habitat while enhancing recreation. Management methods may include: limitations of visitor numbers, camping and travel controls, implementation of fees, alteration of when use takes place, and other similar actions. Additionally, information would be provided to the public concerning the value of riparian wildlife habitat. These management and education efforts would reduce the adverse impacts of recreational uses on riparian-associated wildlife species and their habitats.

4.3.19.8.2 Impacts Common to All Action Alternatives (B, C and D)

All action alternatives would establish focus areas for motorized and multi-use recreation. Recreational OHV and mechanized travel would be consistent with area and route designations described in the travel management plan. The short- and long-term adverse impacts of OHV use are varied and complex. Short-term adverse impacts include human presence and noise disturbances (though some species can become habituated to certain noises). Long-term adverse impacts include habitat fragmentation from roads and cross-country riding, soil compaction, increased erosion, and reduced air quality. These impacts would reduce habitat quality and quantity for wildlife species in a variety of different habitats (Stokowski and LaPointe 2000).

Special "non-motorized focus areas" proposed under some of the action alternatives would help to alleviate both short- and long-term impacts due to increased human traffic, noise, and habitat disturbance resulting from OHV use. Table 4.143 summarizes the acres set aside for non-motorized use by alternative. However, because non-motorized recreation can also be disruptive

of wildlife, these focus areas would also have slight adverse impacts on wildlife associated due to human presence in addition to their beneficial impacts described above.

Table 4.143. Acres of SRMAs and Designated "Non-Motorized Focus Areas" by Alternative*

	Alternative A	Alternative B	Alternative C	Alternative D
SRMAs	135,094	1,020,313	658,642	277,495
Non-Motorized Focus Areas	0	483,062	473,688	142,966

* "Non-motorized focus areas" are managed for hiking, mountain biking, ecological study, equestrian use, climbing, and BASE jumping.

Under all action alternatives, dispersed camping would be allowed where not specifically restricted. Dispersed camping could lead to an increase in human disturbance of wildlife. The creation of new, dispersed campsites would have both direct and indirect adverse impacts on wildlife by encouraging avoidance behavior in individual animals and reducing the quality of the habitat around the campsite (Buechner 1960). Dispersed camping may be closed seasonally or as impacts or environmental conditions warrant within SRMAs in order to decrease the adverse impacts of noise, vegetation trampling, and other human-caused wildlife disturbances.

Under all action alternatives, the BLM would provide visitor information and promote outreach programs focused on low impact recreation techniques. The program would focus on the prevention of the spread of invasive and exotic weeds and the value of wildlife species and their habitats, especially riparian habitats. Educating the public in this way would likely increase awareness and ultimately decrease human impacts on wildlife species and their habitats.

4.3.19.8.2.1 Alternative A

Under Alternative A, only 135,094 acres would be designated as SRMAs; therefore Alternative A has the least beneficial impacts on wildlife from SRMAs. While Alternative A would limit some OHV use to designated routes, it would not include any non-motorized focus areas. Therefore, OHVs would have the greatest adverse effect on wildlife under this alternative. Along with Alternative D, Alternative A would place the fewest limitations on dispersed camping and group size, and would therefore have the greatest potential for human disturbance of wildlife.

4.3.19.8.2.2 Alternative B

Alternative B would designate 1,020,313 acres as SRMAs, and would therefore have the greatest beneficial impacts to wildlife from the increased management and restrictions on recreation in these areas. In addition, 483,062 acres would be designated for non-motorized recreation (Table 4.143), thereby further benefiting wildlife by protecting and improving the quality of wildlife habitats.

In the Colorado Riverway SRMA, the north shore of the river would be managed for high quality bighorn sheep habitat. An additional emphasis would be placed on the protection of riparian

values in the Kens Lake area (South Moab SRMA). Both of these actions would provide beneficial impacts for wildlife species living in these habitats by improving habitat quality and avoiding the adverse impacts of recreation in riparian areas as described above (see Impacts Common to All Alternatives).

Alternative B would be the most restrictive of dispersed camping and group size, and would therefore have the least adverse impacts on wildlife and their habitats due to human disturbance by campers and large groups.

4.3.19.8.2.3 Alternative C

Alternative C would designate 658,642 acres (388% more than Alternative A) as SRMAs. Alternative C would therefore have greater beneficial impacts on wildlife and their habitats than Alternative A, but less than Alternative B. Alternative C would propose fewer acres (473,688 acres) to be managed with a non-motorized focus than Alternative B, but far more than Alternatives A and D (Table 4.143). Similarly, Alternative C would limit camping and group sizes more than Alternatives A and D, but less than Alternative B.

4.3.19.8.2.4 Alternative D

Alternative D would designate 277,495 acres (105% more than Alternative A) as SRMAs. Alternative D would therefore have greater beneficial impacts on wildlife and their habitats than Alternative A, but less than Alternatives B or C. Alternative D would designate 142,966 acres as non-motorized focus areas, far more than Alternative A, and far less than Alternatives B or C. Therefore, Alternative D would result in fewer OHV impacts to wildlife than Alternative A, but more than Alternatives B and C. Dispersed camping and group size would be less restricted than under Alternatives B or C, but more than under Alternative A.

4.3.19.9 Impacts of Riparian Decisions on Wildlife and Fisheries

Wildlife that utilizes riparian habitats would be affected by restrictions on livestock grazing in riparian areas under each alternative. Because these management actions are also proposed as livestock grazing decisions, they are discussed in Section 4.3.19.5 Impacts of Livestock Grazing Decisions on Wildlife and Fisheries.

4.3.19.10 Impacts of Soils/Watershed Decisions on Wildlife and Fisheries

4.3.19.10.1 Impacts Common to All Alternatives

Under all alternatives, soils and watershed decisions would comply with Utah's Standards for Rangeland Health and Guidelines for Grazing and Recreation. In addition, all floodplains and riparian/wetlands would be managed in accordance with Executive Order 11988, which would protect the quality of stream water and Federally listed species habitat. Uses in the MPA would be managed to minimize and mitigate damage to soils, and activities located in areas with sensitive soils would be subject to site-specific NEPA analysis. These restrictions would decrease the number of acres in the MPA subject to the adverse impacts of surface-disturbing

activities on wildlife habitats, including surface water contamination and sedimentation by runoff from disturbed soils.

4.3.19.10.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, vegetation would be maintained based on desired future conditions (DFCs) to provide adequate ground cover to prevent accelerated erosion in wind erodible soils. This would have a positive indirect impact on wildlife by increasing possible forage.

All action alternatives would prohibit surface disturbing activities within 100-year floodplains, public water reservoirs, and within 100 meters of riparian areas and springs. These actions would help to mitigate the adverse impacts of surface disturbing activities on wildlife that utilize riparian habitats. A combination of timing and controlled use stipulations would be applied for all slopes greater than 30% in the MPA, which would help to decrease erosion and therefore habitat degradation for wildlife species. Specifically, these action alternatives would also help to mitigate adverse impacts on fish and other aquatic species' habitat due to increased overland flow associated with upland soil disturbance. Seventy-five percent of protected areas (due to extreme slopes) occur in pinyon-juniper habitat. Wildlife species such as mule deer, elk, pronghorn, mountain lion, and neotropical migrant birds in pinyon-juniper habitat (Table 4.138) would benefit from these stipulations.

4.3.19.10.2.1 Alternative A

Under Alternative A, grazing would be manipulated on portions of ten allotments to lessen impacts on saline soils and reduce salinity in the Colorado River drainage. This action would protect fisheries and aquatic wildlife from salinity impacts, as well as help to lessen the adverse impacts of grazing on wildlife, which are described in Section 4.3.19.5.

4.3.19.10.2.2 Alternative B

Under Alternative B, the Castle Valley and Mill Creek municipal watersheds would be closed to oil and gas leasing and other surface disturbing activities. This would benefit wildlife species and their habitats as described in Section 4.3.19.6.

Watershed Management Plans would be developed and implemented for 17 areas under Alternative B. These plans are generally beneficial to wildlife species and habitats because of specified restrictions on human activities, grazing, and other surface disturbances.

Grazing systems and the development of AMPs would be used to minimize impacts to saline soils in nine allotments. Both of these management strategies would have long-term beneficial impacts on wildlife and fisheries, as described above.

4.3.19.10.2.3 Alternative C

An NSO stipulation to oil and gas leasing and precluding other surface-disturbing activities would be applied in the Castle Valley and Mill Creek municipal watersheds. This stipulation

would help to mitigate the adverse impacts of oil and gas development, but to a lesser degree than Alternative B, which would close this area to oil and gas development.

Watershed Management Plans would be developed and implemented for eight areas under Alternative C. Alternative C would provide fewer beneficial impacts than Alternative B.

Grazing systems would be used and AMPs developed to minimize impacts to saline soils in 16 allotments. Alternative C would require the development of AMPs in seven more areas than under Alternative B.

4.3.19.10.2.4 Alternative D

Under Alternative D, the impacts of soils and watershed management decisions on wildlife and fisheries would be the same as under Alternative A.

4.3.19.11 Impacts of Special Designation Decisions on Wildlife and Fisheries

Special Designation areas, such as Areas of Critical Concern (ACECs) and Wild and Scenic Rivers (WSRs) would generally have long-term positive impacts on the wildlife and fisheries that occur within their boundaries by limiting or preventing surface disturbance, human activities, and associated habitat degradation and fragmentation. Impacts to wildlife and fisheries vary between alternatives primarily according to the proposed acreage of these specifically designated areas.

ACECs designated specifically to protect wildlife and vegetation would directly benefit wildlife species and their habitats. ACECs designated to preserve historic, cultural, and scenic values (as opposed to wildlife or vegetation) would indirectly benefit wildlife by limiting human and surface disturbance, preserving habitat, or preventing noise. Therefore, all ACECs are assumed to be beneficial to wildlife. Where established, ACECs would be avoidance areas for all ROWs, including wind, solar energy, and communication sites. Prohibiting these uses within ACECs would prevent adverse impacts to wildlife related to these developments. The designation of a river as suitable for WSR status would beneficially impact wildlife that utilize habitats directly associated with the river (e.g., riparian, wetlands, open water) by mandating the protection of the river's "free-flowing character" and restricting surface disturbing activities within 1/4 mile of the river.

4.3.19.11.1 Impacts Common to All Alternatives

While they are non-discretionary, WSAs prohibit surface disturbance, permanent new development, and ROWs. In addition, WSAs are closed to mineral leasing. Under all alternatives, where ACECs overlap WSAs, WSA management takes precedence. All alternatives would close WSAs to OHV use or limit such use to designated routes. Therefore, both WSA and ACEC designation would benefit wildlife by reducing surface disturbance in wildlife habitat and habitat fragmentation due to OHV use.

4.3.19.11.2 ALTERNATIVE A

Under Alternative A, none of the proposed ACEC sites would be established (with the exception of the existing 1,375 acre Negro Bill ONA). No rivers would be designated as suitable for WSR status, but eligible rivers would be managed to preserve their wild and scenic qualities. This alternative would generally be less beneficial than Alternatives B and C, which would designate multiple segments as suitable, but more beneficial than Alternative D.

4.3.19.11.3 ALTERNATIVE B

Under Alternative B, all thirteen of the proposed ACEC sites would be established and managed with NSO or closed leasing stipulations. Compared to Alternative A, Alternative B would be much more beneficial to wildlife and their habitats by eliminating disturbances related to salable and leasable mineral development in these areas. Alternative B would designate the most river segments as suitable for WSR status, and would therefore have the greatest beneficial impacts on riparian and aquatic wildlife.

4.3.19.11.4 ALTERNATIVE C

Under Alternative C, five of the thirteen proposed ACEC sites would be established. They would be managed with 34% Open (Standard or Timing controlled) and 66% closed (NSO or closed) leasing stipulations. Alternative C would be more beneficial to wildlife and their habitats than Alternative A, and less than Alternative B. Alternative C would designate fewer river segments as suitable for WSR status than Alternative B, and would therefore have slightly less beneficial impacts on riparian and aquatic wildlife.

4.3.19.11.5 ALTERNATIVE D

Under Alternative D, none of the thirteen proposed ACEC sites would be established. All eligible river segments would be designated as not suitable for WSR status under Alternative D, which would therefore have no beneficial impacts on wildlife and fisheries.

4.3.19.12 IMPACTS OF SPECIAL STATUS SPECIES DECISIONS ON WILDLIFE AND FISHERIES

4.3.19.12.1 IMPACTS COMMON TO ALL ALTERNATIVES

Under all alternatives, no management action would be permitted on public lands that would jeopardize the continued existence of plant or animal species that are listed, officially proposed, or candidates for listing as Threatened and Endangered (T&E). The BLM would commit to current and future conservation agreements, management plans, and recovery plans specific to T&E and BLM Sensitive Species, as described in the Special Status Species section of Table 2.1 (in Chapter 2). Although meant to protect and conserve special status species, the actions would also benefit other wildlife species that share habitat with the targeted special-status species.

4.3.19.12.2 IMPACTS COMMON TO ALL ACTION ALTERNATIVES (B, C AND D)

Under all action alternatives, protective management of prairie dog and sage grouse habitats would benefit big game species because of their overlapping ranges. Limitations on surface-disturbing activities within greater sage-grouse habitat would indirectly benefit deer and elk that winter in the same region by preventing disturbances such as vegetation removal and noise related to traffic or other human activities. Although some protection is common to all action alternatives, they differ in the number of acres affected. Table 4.144 lists the quantitative impacts of sage-grouse and prairie dog habitat conservation on the habitat of mule deer and Rocky Mountain elk, pronghorn antelope, desert bighorn sheep, and Rocky Mountain bighorn sheep.

Table 4.144. Number of Acres Within Big Game Habitats That are Protected for Special Status Species

Big Game Wildlife Species	Relevant Associated Habitat Types	Alternative A	Alternative B	Alternative C	Alternative D
Mule Deer and Elk	Sagebrush, Grassland, Conifer/ Mountain Shrub, Pinyon-Juniper, Riparian/Wetland	0	116,176	64,201	18,223
Pronghorn	Grassland and Desert Shrub, Pinyon-Juniper	0	250,572	135,449	34,942
Desert Bighorn Sheep	Desert Shrub	0	0	0	0
Rocky Mountain Bighorn Sheep	Sagebrush, Grassland	0	9,855	1,082	0
Total Acres		**0**	**376,603**	**200,732**	**53,165**

4.3.19.12.3 ALTERNATIVE A

Alternative A would not implement any special status species decisions that would affect wildlife other than those common to all alternatives.

4.3.19.12.4 ALTERNATIVE B

Alternative B would place restrictions on development within 469,162 more acres of special status species habitat than Alternative A, thereby benefiting other wildlife species. Habitat protections for greater sage-grouse, Gunnison sage-grouse, white-tailed prairie dog, and Gunnison prairie dog habitats would generally benefit other wildlife that utilize desert shrub or sagebrush and perennial grassland habitats, including mule deer, elk, pronghorn, desert bighorn sheep, mountain lion, various raptors, and upland game species.

Approximately 376,603 acres of special status species habitat that would be protected under Alternative B overlap with big game range, thereby conferring some level of protection to big game habitat as well (see Table 4.144). Pronghorn would benefit the most from special status species protections, followed by deer and elk. The habitat of desert bighorn within the MPA does not overlap with any special-status species protected lands under any of the alternatives;

therefore, desert bighorn would not experience any benefits from special status species management. The benefits to big game under Alternative B would be far greater than under Alternative A.

4.3.19.12.5 Alternative C

Alternative C would place restrictions on development within 306,976 more acres of special status species habitat than Alternative A. Alternative C would therefore benefit wildlife species more than Alternative A, but less than Alternative B.

Approximately 200,732 acres of protected special status species habitat would overlap with big game range under Alternative C (see Table 4.144). As under Alternative B, pronghorn would benefit the most from special status species protections, followed by deer and elk, while desert bighorn would not receive any benefit. Although Alternative C would benefit big game more than Alternative A, it would be less beneficial to big game than Alternative B.

4.3.19.12.6 Alternative D

Alternative D would place restrictions on development within 74,792 more acres of special status species habitat than Alternative A, but considerably less than Alternatives B and C.

Approximately 53,165 acres of protected special status species habitat would overlap with big game range under Alternative D, which is more than under Alternative A and less than under Alternatives B and C. The benefits to individual species would be similar to those described under Alternatives B and C, but to a lesser magnitude.

4.3.19.13 Impacts of Travel Management Decisions on Wildlife and Fisheries

The impacts of travel decisions on wildlife would primarily depend on the number of acres open and closed to OHV use under each alternative. OHV use can cause damage to vegetation used as wildlife forage and cover, as well as cause noise disturbance. OHV use therefore generally has adverse impacts on wildlife species, especially birds, in the MPA (Reijnen and Foppen 1994; Gelbard and Belnap 2003). Areas closed to OHV use would include some WSAs. OHV use also contributes to habitat fragmentation and habitat degradation, including the spread of noxious weeds. The impacts of habitat fragmentation due to minerals and travel decisions under each alternative are discussed in Section 4.3.19.18.

4.3.19.13.1 Impacts Common to All Alternatives

Under all alternatives, any new route designations would consider wildlife habitat, thereby reducing surface and noise disturbances on wildlife species and their habitats.

4.3.19.13.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives (B, C, and D), travel by motorized vehicles on all lands administered by the MFO would be limited to designated roads and designated OHV and

motorcycle routes. OHV access for game retrieval, antler collection, and dispersed camping would only be allowed on designated routes. Restricting all vehicles to designated roadways would benefit wildlife by limiting adverse disturbance and noise impacts on wildlife (Fletcher 1980, 1990).

4.3.19.13.3 ALTERNATIVE A

Alternative A would close only 5,060 acres to OHV use (Table 4.145). A total of 620,212 acres would be open to cross-country OHV use under Alternative A (Table 4.146), which is more than under any other alternative. Alternative A would adversely impact wildlife species and their habitats more than the other alternatives because it would continue to manage a large percentage of the MPA as open to OHV use. In addition, travel would be allowed on "existing routes" which also adversely affect wildlife. Existing routes often originate from the unauthorized creation of new trails.

Table 4.145. Wildlife Habitat Closed to OHV Use Under Each Alternative

Habitat Type	Alternative A	Alternative B	Alternative C	Alternative D
Conifer/mountain shrub	0	46,945	46,945	188
Desert shrub	1,360	20,579	17,934	8,977
Invasive species and weeds	3	483	345	19
Pinyon-juniper	2,330	258,913	255,205	42,589
Riparian/wetland	30	3,105	2,450	678
Sagebrush/perennial grass	1,337	16,787	15,968	4,519
Total	**5,060**	**346,812**	**338,847**	**56,970**

Table 4.146. OHV Use Stipulations in Wildlife Habitat Under Each Alternative

Stipulation	Alternative A	Alternative B	Alternative C	Alternative D
Open to Cross-country Travel	620,212	0	1,866	3,064
Limited to Designated (or Existing in A only) Routes	1,123,987	1,475,074	1,418,334	1,762,083
Closed	5,060	346,812	338,847	56,970

Under Alternative A, almost two times more pinyon-juniper habitat would be affected than desert shrub or sagebrush/perennial grasses, which are the next most dominant habitats (see Table 4.145)

4.3.19.13.4 ALTERNATIVE B

No land would be open to cross-country OHV use under Alternative B. OHV use would be limited to designated trails on 1,475,074 acres. This is 622,721 acres (74%) more than under Alternative A. Restricting OHV use to designated rather than existing routes would benefit wildlife by resolving problems caused by the unauthorized creation of new routes, which then

become "existing" routes. Specific benefits to wildlife species would include decreased damage to forage and cover vegetation by travel on unauthorized routes, and decreased disturbance of individual wildlife from human presence and noise associated with OHV use, as well as decreased wildlife habitat fragmentation. Therefore, Alternative B would protect and improve the condition and quality of wildlife habitats and provide more benefits to wildlife species and their habitats than Alternative A. Alternative B would close approximately 346,812 acres to OHV use, which is 341,752 acres more than under Alternative A (see Table 4.145).

Within the areas designated as closed to OHV use, pinyon-juniper habitat would be the most prevalent. Wildlife species that depend on pinyon-juniper habitat for survival and reproduction (including mule deer, elk, pronghorn, mountain lion, and songbirds) would benefit more than other species from the decision to close areas to OHV use. The impacts to various habitat types would be proportionally similar to Alternative A, although fewer acres would be open to OHV impacts.

4.3.19.13.5 Alternative C

Under Alternative C, 1,866 acres would be open to cross-country OHV use, which is 618,346 acres less than under Alternative A. OHV use would be limited to designated routes on 1,481,334 acres, 357,347 acres more than under Alternative A. Finally, Alternative C would close 338,847 acres to OHV use, 334,236 acres more than under Alternative A.

The impacts of this alternative on wildlife are comparable to the impacts of Alternative B, although Alternative B would be slightly more beneficial. Fewer acres would be subject to adverse OHV impacts than under Alternative D. The impacts to various habitat types would be proportionally similar to Alternative A, although fewer acres would be open to OHV impacts (see Table 4.145).

4.3.19.13.6 Alternative D

Under Alternative D, 3,064 acres would be open to cross-country OHV use; 617,148 acres fewer than under Alternative A. OHV use would be limited to designated routes on 1,762,083 acres, or 638,096 more acres than under Alternative A. Finally, 56,970 acres would be closed to OHV use, which is 52,289 more acres than under Alternative A. Travel decisions under Alternative D would be less detrimental to wildlife than under Alternative A, but more detrimental than under Alternatives B or C. The impacts to various habitat types would be proportionally similar to Alternative A (see Table 4.145).

4.3.19.14 Impacts of Vegetation Decisions on Wildlife and Fisheries

4.3.19.14.1 Impacts Common to All Alternatives

Under all alternatives, seed gathering and plant collection would be allowed in all areas meeting Utah's Rangeland Health Standards. This could have short-term, direct, adverse impacts on wildlife species and habitat due to trampling and human disturbance during collection activities, and in some cases depletion of food sources for some species. The spread of noxious, invasive,

and non-native weed species would be controlled through implementation of the BLM weed management policies and action plans. Actions taken to help slow/stop the spread of weeds in the MPA would help reduce the adverse impacts of surface disturbance associated with stock use, oil and gas development, and other activities that result in the adverse alteration of wildlife habitat. Tamarisk and Russian olive would be treated in a number of areas to restore riparian areas. This would have short-term, adverse impacts on wildlife species in the treatment areas, but would have long-term, beneficial impacts by removing undesirable, non-native plant species, thereby improving riparian habitat.

Sagebrush habitat would be managed under the Sage Grouse Habitat Conservation Strategy (BLM 2004c), which would have long-term beneficial impacts on wildlife species that utilize sagebrush habitat (Monsen et al. 2004).

4.3.19.14.2 Alternative A

The impacts to wildlife and fisheries would be limited to those common to all alternatives.

4.3.19.14.3 Alternative B

Under Alternative B, any loss of sagebrush steppe habitat deemed essential to wildlife would be reclaimed at a ratio of 2:1. This requirement would have long-term, beneficial impacts on wildlife by preventing the net loss of essential sagebrush habitat.

4.3.19.14.4 Alternative C

Under Alternative C, any loss of sagebrush steppe habitat deemed essential to wildlife would be reclaimed at a ratio of 1:1. This would have similar impacts as those under Alternative B, except that habitat would be replaced at only half the rate.

4.3.19.14.5 Alternative D

Under Alternative D, the impacts of vegetation management decisions on wildlife and fisheries resources would to the same as those described under Alternative C.

4.3.19.15 Impacts of Visual Resources Decisions on Wildlife and Fisheries

4.3.19.15.1 Impacts Common to All Alternatives

The impacts to wildlife from visual resources decisions are primarily associated with limitations on surface disturbance intended to reduce impacts to areas with high visual resource values. VRM Class I and II designations are the most restrictive of oil and gas development and other surface-disturbing activities, and would therefore be the most beneficial to wildlife and their habitats (as described in Section 4.3.19.6). In areas designated as VRM Classes I or II, surface-disturbing activities are generally prohibited or limited.

4.3.19.15.2 Impacts Common to All Action Alternatives (B, C and D)

Under all action alternatives, WSR segments would be managed as VRM Class I or II. 'Limited' and 'very limited' management activities would be allowed in areas designated as VRM Classes II or I, respectively. All VRM Class I areas would be classified as NSO for oil and gas leasing. A controlled surface use stipulation would be applied to all areas managed as VRM Class II.

4.3.19.15.3 Alternative A

Alternative A would designate 750,125 acres (or 41% of MPA) as VRM Class I or II.

4.3.19.15.4 Alternative B

Under Alternative B, 827,093 acres would be designated as VRM Class I or II. Alternative B would manage the highest percentage of the MPA (45%) as VRM Class I or II; it would therefore be the most beneficial for wildlife.

4.3.19.15.5 Alternative C

Under Alternative C, 724,587 acres (or 40% of the MPA) would be designated as VRM Class I or II, less than under Alternatives A and B, and more than under Alternative D.

4.3.19.15.6 Alternative D

Under Alternative D, 595,390 acres would be designated as VRM Class I or II. Alternative D would manage the smallest percentage of the MPA (33%) as VRM Class I or II; it would therefore be the least beneficial to wildlife.

4.3.19.16 Impacts of Wildlife and Fisheries Management Decisions on Wildlife and Fisheries

4.3.19.16.1 Impacts Common to All Alternatives

Under all alternatives, the Hatch Point, Potash-Confluence, and Dolores Triangle Habitat Management Plans (HMPs) would continue to be modified and implemented to benefit wildlife. Each HMP would be managed to benefit target species; however all species within those habitat types would benefit. Beneficial protections that may be included in HMPs include: conservation measures, replacement and mitigation stipulations, monitoring protocols, and species-specific management stipulations.

Livestock would be excluded from 48,220 acres on portions of seven allotments in order to benefit wildlife and recreation. The removal of grazing would lead to long-term beneficial impacts to wildlife utilizing those areas. The adverse impacts of grazing on wildlife are discussed in Section 4.3.19.5.

4.3.19.16.2 Impacts Common to All Action Alternatives (B, C, and D)

Under all action alternatives (by utilizing Rangeland Health Standards) modification of grazing seasons and livestock classes to accommodate wildlife would enhance forage needs of wildlife in the MPA. The introduction, transplantation, augmentation, and re-establishment of wildlife species such as (but not limited to) pronghorn, desert bighorn sheep, Rocky mountain bighorn sheep, wild turkey, bison, beaver, otter, and Colorado River cutthroat trout would be considered. Where implemented, these actions would increase the viability and genetic diversity of the affected species' populations.

4.3.19.16.2.1 Impacts to Pronghorn

Under all action alternatives, 78,476 acres in the La Sal (Hatch Point herd) wildlife management unit would continue to be managed for pronghorn habitat, with an additional 743,524 acres of habitat managed in the Bookcliffs management unit (Cisco herd). Management actions benefiting pronghorn would include the following: installing and improving year-round water resources, supporting beneficial changes in livestock grazing classes (changing from sheep to cattle), installing water developments every 2 square miles on summer and fawning areas, constructing fences that allow for pronghorn passage, dismantling unnecessary fences, installing restrictive fences that stop pronghorn passage onto highways, and implementing vegetation treatments to increase forage on approximately 4,400 acres.

4.3.19.16.2.2 Impacts to Bighorn Sheep

Under all action alternatives, the recommendations for management actions in the BLM Bighorn Sheep Management Plan (1993b, as revised), the Utah BLM Statewide Desert Bighorn Sheep Management Plan (1986a, as revised), and the Revised Guidelines for the Management of Domestic Sheep and Goats in Native Wild Sheep Habitats (BLM 1998a) would be followed. The current population of desert bighorn sheep would be supported on 330,892 acres, and management would focus on increasing bighorn populations. A timing limitation stipulation for oil and gas and other surface-disturbing activities applied to 9,278 acres of habitat in the Hatch Point area would reduce noise and human activity during bighorn lambing and rutting seasons. Approximately 317,523 acres on 13 grazing allotments would be managed as desert bighorn sheep habitat; reduced livestock grazing could make additional forage available to desert bighorn sheep. Conversion of cattle allotments to sheep would be prohibited and the Hatch Point Allotment would be converted to cattle; these actions would help prevent the passage of diseases between domesticated sheep and desert bighorn sheep. Timing limitations for filming would be put in place on 123,490 acres to protect bighorn from the disturbance of film crews during bighorn lambing and rutting. Habitat management decisions benefiting bighorn sheep would include: installing water developments every 5 square miles in or within 2 miles of escape terrain; precluding exotic ungulates, wild horses, or burros within 10 miles of habitat; constructing fences that would allow for bighorn sheep passage; and dismantling unnecessary fences. In addition, water developments would be maintained to help bighorn sheep survive drought periods.

4.3.19.16.2.3 Impacts to Deer and Elk

Under all action alternatives, current mule deer and elk habitat (534,329 acres in the Bookcliffs, 313,551 acres on the La Sal Mountains) would be managed to improve vegetative and ecological conditions for both deer and elk. A timing limitation stipulation would be applied to all oil and gas and other surface-disturbing activities within 105,636 acres of BLM-designated crucial and substantial deer and elk habitat, which would protect these species from human-caused disturbances during crucial times of year such as fawning and/or calving periods. Deer habitat would be enhanced by allocating all forage to deer in crucial winter range on acquired state lands in Upper Castle Valley. Elk habitat would be enhanced by increasing elk forage on approximately 40,000 acres of elk winter range through vegetation treatments.

4.3.19.16.2.4 Impacts to Raptors

Raptor management would be guided by the use of Best Management Practices for Raptors and Their Associated Habitats in Utah (see Appendix O), utilizing seasonal and spatial buffers, as well as mitigation, to maintain and enhance raptor nesting and foraging habitat, while allowing other resource uses. BLM would also cooperate with utility companies, UDWR, and USFWS to prevent raptor electrocution. Seasonal closures or spatial restrictions would be used to eliminate disturbance near raptor nests from recreation, mineral development, and other activities that might result in nest abandonment.

4.3.19.16.2.5 Impacts to Migratory Birds

Adherence with the Migratory Treaty Bird Act and Executive Order 13186 (Responsibilities of Federal Agencies to Protect Migratory Birds) under all action alternatives would have beneficial impacts on migratory birds, including priority species identified on the USFWS "Birds of Conservation Concern" list (2002f and as updated) and the "Partners-in-Flight" priority species list (as updated). The use of adaptive management strategies would more effectively conserve habitat and avoid impacts to these species. Avoidance of surface-disturbing activities and vegetation-altering projects during the nesting season (May 1 through July 30), including broad-scale use of pesticides, would improve the habitat of migratory birds in the MPA and reduce adverse disturbance of birds and their habitats. These benefits would be most pronounced in the Cisco Desert Bird Habitat Conservation Area, the Colorado and Dolores River Bird Habitat Conservation Area, the Green River Bird Habitat Conservation Area, and the Cottonwood and Willow Creek Bird Habitat Conservation Area (see Appendix N).

Under all action alternatives, the prioritization of habitat types most commonly used by migratory birds (lowland riparian, wetlands, and low and high desert shrub) for maintenance and improvement would increase the availability of high-quality habitat and reduce the adverse impacts of invasive plants (e.g., cheatgrass, tamarisk, Russian olive).

4.3.19.16.3 Impacts Varying among Alternatives

Impacts of wildlife and fisheries management decisions that would vary between alternatives would primarily result from temporal and spatial restrictions on development and other surface-

disturbing activities in BLM-designated wildlife habitats. These protections would benefit big game species by reducing surface disturbance and other human-related disturbances in crucial locations and during crucial times of the year and improve the quality and condition of wildlife habitats. They would also benefit other wildlife species such as birds, small mammals, and reptiles that use the same habitats. Additional impacts that may affect wildlife would come from the size of designated and managed wildlife habitats and the extent of other resource uses within those habitats, as well as how prescriptions would affect the biotic condition and quality of those wildlife habitats.

Under all alternatives, protections for deer and elk habitat occur primarily in sage/shrublands, pinyon-juniper woodlands, and grasslands, while those in pronghorn habitat occur primarily in desert shrubland and desert grasslands. Land protected for desert bighorn is dominated by desert shrub, while Rocky Mountain bighorn habitat consists mainly of mountain and desert shrublands and limited pinyon-juniper woodlands. Therefore, wildlife species that occur mainly in shrubland and pinyon juniper woodland habitats (see Table 138) would benefit most from the special protection of big game habitats.

4.3.19.16.3.1 Alternative A

Under Alternative A, the management of 260,769 acres of deer and elk winter range would restrict exploration, drilling, and other development activity from November 1 through May 15. Development restrictions would protect pronghorn fawning habitat between May 15 and June 20. Approximately 42,500 acres of desert bighorn sheep habitat would be protected by preventing human disturbance during breeding and lambing seasons. Approximately 194,560 acres of land would be designated and managed as Rocky Mountain bighorn sheep habitat.

Alternative A would have the fewest acres of wildlife habitat subject to special wildlife conditions (497,829 acres), and would therefore benefit wildlife and fisheries resources the least.

4.3.19.16.3.2 Alternative B

Under Alternative B, the management of 635,774 acres of crucial and substantial deer and elk winter habitat would preclude surface-disturbing activities from November 1 through May 15. Alternative B would place restrictions on almost 2.5 times as much deer and elk habitat as Alternative A.

Management of approximately 822,001 acres of crucial antelope habitat would preclude surface-disturbing activities from May 1 through June 15 to protect fawning areas. In addition, spring livestock grazing would be modified on 188,975 acres of crucial pronghorn habitat by removing livestock by February 28 each year to encourage forb production and vegetative cover. Livestock would also be removed from fawning areas on Hatch Point between May 1 and June 30 to reduce competition for space and forage between livestock and pronghorn fawns. The elimination of spring grazing in Alternative B would improve habitat quality and condition compared to Alternative A, and would also lead to greater carrying capacity and herd recruitment. More acreage would be managed as pronghorn habitat (and for a longer time period) under Alternative

B than Alternative A and 188,975 acres would be managed to improve the quality and condition of pronghorn habitat.

A total of 130,419 acres of desert bighorn lambing, rutting, and migration habitat would be managed under No Surface Occupancy (NSO) stipulations for oil and gas as well as precluding all other surface-disturbing activities. In addition, within 46,319 acres of desert bighorn sheep lambing habitat, camping would be limited to designated sites. Livestock grazing would be removed by March 31 on the North River and Taylor (Dry Mesa Pasture only) allotments. More habitats would be managed for desert bighorn sheep under Alternative B than under Alternative A. Limited grazing, camping restrictions and no surface occupancy in Alternative B would improve habitat quality and condition compared to Alternative A and would also lead to greater carrying capacity and herd recruitment.

Under Alternative B, 458,242 acres of land would be designated and managed as Rocky Mountain bighorn sheep habitat. This is substantially more than the 194,560 acres designated as such under Alternative A. This increase in the habitat size improves carrying capacity, thus benefiting bighorn more than Alternative A.

Under this alternative, there would be 1,548,607 more acres (or three times more area) subject to special wildlife conditions than under Alternative A. Therefore, Alternative B would protect and improve the condition and the quality of wildlife habitats, and be more beneficial to wildlife than Alternative A.

4.3.19.16.3.3 Alternative C

Under Alternative C, management of 349,955 acres of crucial deer and elk habitat would preclude surface-disturbing activities from November 15 through April 15 each year. Alternative C would restrict activities on more deer and elk habitat than Alternative A, but less than Alternative B.

Management of approximately 293,741 acres of pronghorn antelope fawning habitat would preclude surface-disturbing activities from May 1 through June 15. In addition, spring livestock grazing would be adjusted on a case-by-case basis within 188,975 acres of crucial pronghorn habitat to encourage forb production. Rest/rotation management systems would also be considered for grazing areas within crucial pronghorn habitat. Limited grazing in Alternative C would improve habitat quality and condition more than under Alternative A, but less than Alternative B and would also lead to greater herd recruitment. Alternative C would restrict surface-disturbing activities and grazing on more acres of pronghorn habitat than Alternative A, but fewer than Alternative B.

A total of 111,337 acres of desert bighorn lambing, rutting, and migration habitat would be managed with NSO stipulations for oil and gas as well as precluding all other surface-disturbing activities. However, within migration corridors, pipeline construction and geophysical exploration for oil and gas development would be allowed outside lambing and rutting periods from June 16 through September 30 and from January 1 to March 31. In addition, within 46,319 acres of desert bighorn sheep lambing habitat, camping and livestock grazing would be limited.

Limited grazing, camping and surface disturbance in Alternative C would improve habitat quality and condition more than under Alternative A but less than Alternative B and would also lead to greater herd recruitment. More habitat would be conserved for desert bighorn sheep under Alternative C than under Alternative A. However, Alternative C would not be as beneficial to desert bighorn sheep or the other wildlife species that share its habitat as Alternative B, since Alternative C would restrictively manage fewer acres.

Under Alternative C, 310,726 acres of land would be designated and managed as Rocky Mountain bighorn sheep habitat. This is substantially more acres and carrying capacity than would be designated under Alternative A, but less than under Alternative B.

Alternative C would manage 567,930 more acres (or twice as much area) under special wildlife conditions than Alternative A. Therefore, Alternative C would be more beneficial to wildlife species in the MPA than Alternative A. Alternative C would be less beneficial to wildlife species and their habitats than Alternative B, since Alternative C would manage half as many acres under special wildlife conditions than Alternative B.

4.3.19.16.3.4 Alternative D

Alternative D would preclude surface-disturbing activities on 349,955 acres of crucial deer and elk habitat from December 1 through April 15 each year. This restriction is the same as Alternative C.

Approximately 78,477 acres of pronghorn antelope fawning habitat would preclude surface-disturbing activities from May 1 through June 15. Alternative D would be more beneficial to wildlife than Alternative A, but less so than Alternatives B or C. Alternative D would not offer specific management opportunities to maintain or improve antelope habitats; therefore the condition and quality of 188,975 acres of crucial antelope habitat would be degraded or removed, reducing herd recruitment. Alternative D would be less beneficial to antelope habitat the Alternatives A, B, and C.

A total of 46,319 acres of desert bighorn lambing and rutting habitat would preclude surface-disturbing activities from April 1 to June 15 and from October 15 to December 15. Livestock restrictions would be the same as under Alternative C. In addition, camping would be unrestricted within this area. Limited grazing in Alternative D would improve habitat quality and condition more than under Alternative A, the same as Alternative C, but less than Alternative B and would also lead to herd recruitment. Alternative D would not be as beneficial to desert bighorn sheep as Alternatives B, or C

Under Alternative D, 194,560 acres of land would be designated and managed as Rocky Mountain bighorn sheep habitat. This is equal to the amount of land designated under Alternative A, but less than under Alternatives B or C. Therefore, Alternative D would be less beneficial to bighorn sheep than Alternative B and C and the same as A

There would be 171,482 more acres subject to special wildlife conditions under Alternative D than under Alternative A. Therefore, Alternative D would be more beneficial to wildlife than Alternative A and less beneficial to wildlife than Alternatives B or C.

4.3.19.17 Impacts of Woodlands Decisions on Wildlife and Fisheries

Woodlands decisions' impacts on wildlife would depend primarily upon the number of acres of wildlife habitat open to woodland harvest under each alternative. Adverse impacts to wildlife from woodland harvest include direct habitat loss, habitat degradation, and habitat fragmentation. Indirect, adverse impacts of wood gathering on wildlife species and their habitats include trampling and removal of native vegetation, which result in habitat degradation that can include reduction of prey species, forage species, and cover.

Although large areas of the MPA are open to woodland harvest under all alternatives, adverse impacts would be concentrated in areas with vegetation types that would support public and commercial harvesting activities. Pinyon-juniper woodland and conifer/mountain shrub are generally the only habitat types considered for harvest. Therefore, the impacts under each alternative were assessed according to the area of those vegetation types open to woodland harvest (Table 4.147).

Table 4.147. Number of Acres in the MPA Open and Closed to Woodland Harvesting

Zone	Alternative A	Alternative B	Alternative C	Alternative D
Total Closed	601,146	863,227	646,694	601,146
Total Open	1,217,635	961,039	1,172,436	1,217,635
Open Areas with Woodland Vegetation (Pinyon-juniper or Conifer / Mountain Shrub vegetation)	455,134	300,950	420,967	455,134

4.3.19.17.1 Impacts Common to All Alternatives

The Healthy Forests Restoration Act of 2003 would be implemented under all alternatives. This action would help mitigate the adverse impacts of woodland product use on wildlife species and their habitats in areas of the MPA open to wood harvesting.

4.3.19.17.2 Alternatives A and D

Approximately 455,134 acres of woodlands with pinyon-juniper or conifer vegetation would be open to harvest under Alternatives A and D. These alternatives would have the largest impact on wildlife.

4.3.19.17.3 Alternative B

Approximately 300,950 acres of woodlands with pinyon-juniper or conifer vegetation would be open to woodland harvest under Alternative B, which would have the fewest adverse impacts on wildlife.

4.3.19.17.4 ALTERNATIVE C

Approximately 420,967 acres of woodlands with pinyon-juniper or conifer vegetation would be open to harvest under Alternative C. Therefore, Alternative C would be less detrimental to wildlife than Alternatives A and D, but more detrimental than Alternative B.

4.3.19.18 IMPACTS OF HABITAT FRAGMENTATION ON WILDLIFE

In addition to directly disturbing wildlife habitat, roads associated with minerals and travel decisions also fragment adjacent (undisturbed) habitat, thereby degrading its value to wildlife. Habitat fragmentation may be less obvious than direct impacts such as vehicle collisions with wildlife or vegetation removal, but often carries considerable consequences for long-term population and reproductive success. Large expanses of habitat may be required to meet the minimum habitat requirements of the largest, most widely roaming species, including top carnivores and large migrating herd animals.

The impacts of habitat fragmentation from foreseeable oil and gas development and each alternative's travel management plan were analyzed for deer and elk, desert bighorn, Rocky Mountain bighorn, sage grouse, and migratory birds (discussions of impacts to sage grouse are provided in Section 4.3.15, Special-Status Species). These species were selected for analysis for three reasons: 1) they are species of high interest; 2) published studies were available that provided suitable fragmentation thresholds to assess impacts to the species; 3) GIS data were available to support the analyses. Other wildlife species (e.g., amphibians, reptiles, small game, and raptors) would likely also be impacted by habitat fragmentation, but did not meet the analysis criteria above.

4.3.19.18.1 GENERAL METHODOLOGY

GIS models were created to analyze the degree of habitat fragmentation under each alternative. The models were based on the BLM's best available GIS data for existing roads within the MPA (the Travel Plan from Alternative A). The model also utilized habitat acreages proposed under Alternative B for each species, which is the most inclusive of BLM-proposed habitat. Within areas of the MPA that would be open to oil or gas well development (under Standard, Controlled Surface Use, or Controlled Surface Use and Timing Stipulations), the number of wells expected under the RFD scenario were randomly distributed by RFD area. Only roads impacts were considered in the models; individual wells were assumed to have no area and no effect on fragmentation.

Once the wells had been distributed within the network of existing roads, the model generated new roads that connected each well to the nearest existing road. Roads were generated as the shortest straight line from well to existing road, without consideration for topography or ease of travel. The habitat fragmentation analysis considered the impacts of all BLM-identified existing roads and new computer-generated roads on the habitat of each wildlife species examined.

Several potential sources of error affect these analyses. First, not all existing roads were included in the GIS database utilized in the models due to unofficial and uninventoried roads. Therefore,

these analyses may slightly underestimate some adverse impacts from habitat fragmentation. Second, many roads in the MPA are rarely traveled by vehicles (personal communication, Katie Stevens), and would therefore have little contribution to habitat fragmentation. Including roads with little travel would tend to overestimate the impacts of roads on wildlife habitat. Because the impacts of under- and over-estimation would be consistent across all alternatives, the results presented should be useful for comparative purposes.

4.3.19.18.2 Analysis of Impacts to Wildlife

4.3.19.18.2.1 Mule Deer

Methodology: Habitat fragmentation for mule deer was assessed by determining the proportion of habitat where road densities would exceed 0.16 km/km². Habitat where this threshold would be exceeded was considered unfavorable, following Sawyer et al. (2006a, 2006b), who found that mule deer preferentially use habitat where road densities are </= 0.16 km/km² in a natural gas field in western Wyoming. Road density was calculated per km^2 of BLM-designated habitat in the MPA.

Results: Table 4.148 presents the proportion of BLM-designated mule deer habitat that would be considered unfavorable to mule deer due to fragmentation by roads under each alternative.

Table 4.148. Percent of Mule Deer Habitat Considered Unfavorable After Fragmentation by Roads (road density > 0.16 km/km²)

	Alternative A	Alternative B	Alternative C	Alternative D
Percent Mule Deer Habitat Unfavorable	50%	39%	42.5%	48%

Under Alternative A, approximately half of the mule deer habitat in the MPA would be unfavorable to mule deer due to existing roads and those expected due to reasonably foreseeable minerals development. Existing roads are by far the largest contributor to this fragmentation, with less than 100 miles of new roads expected due to minerals development. Alternative B would be the least detrimental to mule deer, adversely affecting 39% of the available habitat, 11% less (of the total) than under Alternative A.

4.3.19.18.2.2 Elk

Methodology: Habitat fragmentation for elk was assessed by determining the proportion of habitat where road densities would exceed 0.62 km/km². Habitat where this threshold would be exceeded was considered unfavorable, following Lyon (1983), who found that elk preferentially use habitat where road densities are </= 0.62 km/km². Road density was calculated per square km of BLM-designated habitat in the MPA.

Results: Table 4.149 presents the proportion of BLM-designated elk habitat that would be considered unfavorable to elk due to fragmentation by roads under each alternative.

Table 4.149. Percent of Elk Habitat Considered Unfavorable After Fragmentation by Roads (road density > 0.62 km/km²)

	Alternative A	Alternative B	Alternative C	Alternative D
Percent Elk Habitat Unfavorable	39%	29%	32%	33%

Under Alternative A, approximately 39% of the elk habitat would be unfavorable to elk due to existing roads and those expected due to reasonably foreseeable minerals development within the MPA. Existing roads are by far the largest contributor to this fragmentation, with less than 100 miles of new roads expected due to minerals development. Alternative B would be the least detrimental to elk, adversely affecting 29% of the available habitat, 10% less (of the total) than under Alternative A.

4.3.19.18.2.3 Bighorn Sheep

Methodology: The impacts of habitat fragmentation on both Rocky Mountain and desert bighorn sheep were assessed using habitat patch size, rather than road density (as with mule deer and elk above). This assessment assumed that patch sizes smaller than 159 km² were generally unsuitably fragmented, following Singer et al. (2001), who found that bighorn sheep released into habitat patches of at least 158.7 km² ± 60.3 km² colonized an average of one neighboring patch, while bighorn released in smaller patches did not colonize neighboring areas and eventually left the area. Patch colonization is a necessary precursor to reproduction and population maintenance. Desert and Rocky Mountain bighorn sheep are more sensitive to encroachment and habitat fragmentation than are other ungulates in the MPA (Singer et al. 2001).

Desert Bighorn Sheep Results: Table 4.150 presents the acres of BLM-designated desert bighorn sheep habitat (128,028 acres of the total habitat of 330,892 acres) that would be found in patches larger or smaller than 159 km² under each alternative.

Table 4.150. Desert Bighorn Sheep Habitat Fragmentation

Alternative	Acres of Habitat in Patches <159 km²	Acres of Habitat in Patches >=159 km²
Alternative A	128,028	0
Alternative B	128,832	0
Alternative C	128,659	0
Alternative D	128,619	0

Under Alternatives A, B, C, and D, no unfragmented or favorable habitat exists within the MPA. Therefore, all desert bighorn habitat would effectively be unsuitable due to fragmentation. However, as stated above in the General Methodology section, many roads within desert bighorn habitat are not heavily traveled, and may not have as strong of an impact as the results suggest.

Alternative B (with the fewest number of new roads planned) would provide the greatest amount of suitable bighorn habitat.

Rocky Mountain Bighorn Sheep Results: Table 4.151 presents the acres of BLM-designated Rocky Mountain bighorn sheep habitat that would be found in (unfragmented) patches larger or smaller than 159 km² under each alternative.

Table 4.151. Rocky Mountain Bighorn Sheep Habitat Fragmentation Analysis (acres)

Alternative	Acres of Habitat in Patches <159 km²	Acres of Habitat in Patches >=159 km²
Alternative A	117,518	310,814
Alternative B	67,729	361,113
Alternative C	70,202	358,551
Alternative D	70,202	358,503

Alternative B would be the most favorable alternative for Rocky Mountain bighorn within the MPA. Alternative A would fragment approximately 47,316 more acres into unsuitably small patches than Alternative C or D, and 49,789 more acres than Alternative B.

4.3.19.18.2.4 Migratory Birds

Methodology: Fragmentation of migratory bird habitat was assessed by calculating the percentage of migratory bird habitat that would be impacted by vehicle and pedestrian traffic. The potential area of impact was assumed to be a 400-meter buffer along each side of all roads in designated migratory bird habitat. This buffer represents an average distance based on applicable literature (Clark and Karr 1979; Connelly et al. 2000; Crawford et al. 2004; UDWR 2002).

Because numerous migratory bird species use various habitats in the MPA, impacts were analyzed based on habitat types, which could then be extrapolated to specific bird species.

Results: Table 4.152 presents the percentage of each habitat type that falls within the 400-meter buffer surrounding roads in the in the MPA by alternative, as well as representative bird species that would be impacted. Although other birds utilize these habitats, these migratory birds were selected for analysis because many of them are found on lists of Sensitive species (Partners in Flight and Birds of Conservation Concern). The presence of roads can have many detrimental impacts on avian communities, including displacement, loss of habitat, and vehicular-related mortalities. Vehicles often hit and kill birds that are attracted to roadside vegetation, spilled grain, or dead animals (Forman and Alexander 1998).

Table 4.152. Percentage of Vegetation Habitat Types Impacted by 400-meter Road Buffer for Migratory Birds

Vegetation Type	Associated Species	Alternative A	Alternative B	Alternative C	Alternative D
Conifer and Mountain Shrub	Clark's Nutcracker, Flammulated Owl, Grace's Warbler, Gray Vireo	24.1	15.0	16.8	19.4
Desert Shrub	Ash-throated Flycatcher, Brewer's Sparrow, Golden Eagle	74.6	50.9	56.2	58.0
Pinyon-Juniper	Black-throated Gray Warbler, Gray Vireo, Juniper Titmouse, Pinyon Jay	48.2	37.7	41.1	42.7
Riparian and Wetland	Blue Grosbeak, Cooper's Hawk, Hermit Thrush, Peregrine Falcon, Northern Harrier	65.3	45.9	54.3	56.7
Sagebrush and Perennial Grassland	Horned Lark, Brewer's Sparrow, Sage Thrasher, Western Meadowlark	69.9	58.7	64.4	65.2
Average		**60.2**	**44.0**	**48.4**	**50.0**

Under each of the alternatives, birds that use desert shrub habitats would experience the most habitat fragmentation. Migratory birds that utilize pinyon-juniper woodlands would be the next most heavily impacted by road effects and habitat fragmentation.

Of all the alternatives, Alternative A would cause the most fragmentation by allowing approximately 294,700 more acres of disturbance compared to Alternative B, 216,099 more than Alternative C, and 185,650 more than Alternative D. Alternative B would cause the least amount of road-related disturbance to migratory bird habitat (in total and within each habitat type).

4.3.19.19 Summary of Impacts

See Table 2.2 of Chapter 2 for a summary of impacts to wildlife and fisheries resources.

4.3.20 WOODLANDS

This section discusses impacts to woodlands from management actions of other resources and resource uses discussed in Chapter 2. Existing conditions concerning woodlands are described in Chapter 3.

For analysis purposes, the management of non-WSA land with wilderness characteristics, high use recreation areas, some ACECs and all WSAs prohibits the harvesting of woodland products. This restriction would result in adverse impacts to the harvesting of woodland products. The great majority of this harvesting is casual collection by individuals, such as for firewood, fence posts, Christmas trees, landscaping, greenwood cutting, and sundry use). Conversely, it was assumed that areas within the MPA that were open to woodlands harvesting would have beneficial impacts on the resource because 1) opportunities would be available to the public to harvest wood for a variety of uses, and 2) managed woodland harvesting (harvesting-related fuel load reductions).would reduce wildland fire risks in dense woodland stands. The criteria for impacts analysis were the number of acres available and unavailable for woodland harvesting within the MPA.

There have been no timber sales in the MPA in the recent past. Therefore, for analysis, it is assumed that there would be no timber sales within the MPA during the life of the plan. Any future timber sale would only be allowed within open to woodland harvest areas, and would be analyzed on a site-specific basis.

Utah Riparian Policy prohibits the harvest of riparian species such as cottonwood and willow (except for Native American uses). Harvest of these riparian species is therefore not analyzed further.

4.3.20.1 IMPACTS COMMON TO ALL ALTERNATIVES

Under all alternatives, permits for woodland harvesting would continue to be sold, and wood gathering areas would continue to be designated. These management actions would reduce the need for fire treatments in dense woodlands, support the goals of the Fire Management Plan, and improve woodland ecosystem health by thinning woodlands stands and allowing the removal of dead and diseased trees. This management action would have long-term, beneficial impacts to woodland resources.

4.3.20.2 IMPACTS COMMON TO ALL ACTION ALTERNATIVES (B, C AND D)

Under Alternatives B, C, and D, implementing the Healthy Forest Initiative and the 2003 Healthy Forests Restoration Act would have long-term, beneficial impacts on woodland resources, along with the MPA Fire Management Plan mentioned above, by maintaining and/or restoring woodland ecosystem health and ensuring the sustainability of woodland resource productivity for long-term harvesting.

4.3.20.3 ALTERNATIVES IMPACTS

Air quality, cultural resources, human health and safety, lands and realty, livestock grazing, paleontology, minerals, special status species, soil/watershed, travel management, vegetation, visual resources , and wildlife and fisheries management actions would have negligible to minor impacts on woodland resources and will not be analyzed further in this section. The impacts would be negligible because maintaining air quality within the MPA, protecting the public from AML site hazards and reducing the risks of hazardous materials spills and cleanup, establishing utilization levels and maintaining proper functioning condition on rangelands, allowing fossil study and recreational collection of fossils, leasing areas for minerals exploration and development, maintaining and improving native vegetation communities, protecting scenic quality under designated VRM Class objectives, and maintaining and improving wildlife habitat would neither reduce or enhance the opportunities for woodland harvesting nor inhibit the ability of the Moab FO to maintain a healthy, sustainable woodland ecosystem.

Decisions concerning fire management, recreation, special designations, non-WSA lands with wilderness characteristics and woodlands will be discussed below.

4.3.20.3.1 IMPACTS OF FIRE MANAGEMENT DECISIONS ON WOODLANDS RESOURCES

Under all alternatives, woodland resources would be subject to fire management fuels treatments to reduce the risk of wildland fire through a fire management program. Estimated fuels reduction treatments of 5,000 to 10,000 acres/year would be conducted dependent on budgetary and time constraints. This could cause surface disturbance-related soil erosion and increase the likelihood of noxious weed invasion and establishment and long-term displacement of woodland species. These fire-related activities would increase the likelihood of short-term and long-term, adverse impacts on woodland resources productivity. Fire treatments would also have short-term adverse impacts on woodlands harvesting from restrictions placed on entry into fuels reduction-treated areas during vegetation re-growth. Fire management actions under this alternative would be beneficial in the long-term because they would reduce the risk of wildland fire in dense stands, improve fire condition classes, and protect woodland resources for sustainable yields of woodland products.

4.3.20.3.2 IMPACTS OF NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS DECISIONS ON WOODLANDS RESOURCES

4.3.20.3.2.1 Alternative A

Under this alternative, no non-WSA lands would be managed for wilderness characteristics, which would result in no impacts to woodland harvesting from these decisions. Woodland resources may be impacted because woodlands would remain intact.

4.3.20.3.2.2 Alternative B

Under Alternative B, 266,485 acres of non-WSA lands would be managed for wilderness characteristics, with prohibitions on wood cutting. These areas have limited woodland resources,

are remote and isolated, and have limited motorized access. For these reasons, non-WSA lands with wilderness characteristics are not popular for woodcutting activities. Thus, there would be no long-term, adverse impacts on the harvesting of woodland products within the MPA. Woodland resources would be retained on those 266,485 acres.

4.3.20.3.2.3 Alternative C

Under Alternative C, 47,561 acres of non-WSA lands would be managed for wilderness characteristics, with prohibitions on harvesting in these areas. Three of these areas have limited woodland resources and have limited access. (Beaver Creek non-WSA lands are remote and isolated from populated areas). For these reasons, these areas are not popular for woodcutting activities. Thus, there would be no long-term, adverse impacts on the harvesting of woodland products within the MPA. Woodland resources would be retained on those 266,485 acres.

4.3.20.3.2.4 Alternative D

Under Alternative D, no non-WSA lands would be managed for wilderness characteristics, resulting in no impacts to woodland harvesting from these types of decisions. Woodland resources may be impacted because woodlands would remain intact.

Table 4.153 illustrates acres closed to Woodland Harvest within non-WSA lands with wilderness characteristics, by alternative.

Table 4.153. Acres Closed to Woodland Harvesting within Non-WSA Areas Identified with Wilderness Characteristics

	Alternative A	Alternative B	Alternative C	Alternative D
Non-WSA acres managed for wilderness characteristics (acres)	0	266,485	47,561	0

4.3.20.3.3 Impacts of Recreation Decisions on Woodlands Resources

SRMAs and portions of SRMAs that are heavily used by recreationists are closed to woodland harvest to prevent unnecessary degradation to vegetation. SRMAs include Canyon Rims, Colorado Riverway, and portions of Labyrinth Rims/Gemini and South Moab. A comparison of acres closed to woodland harvesting within SRMAs is shown below in Table 4.154.

Table 4.154. Acres Closed to Woodland Harvesting within SRMAs

	Alternative A	Alternative B	Alternative C	Alternative D
SRMA acres closed to woodland harvesting	180,657	234,590	255,555	180,657

For Alternatives C and D, the impacts of recreation management actions on woodland resources would be similar to those discussed for Alternative B.

4.3.20.3.4 Impacts of Special Designations Decisions on Woodlands Resources

4.3.20.3.4.1 Alternative A–D

Wilderness Areas and Wilderness Study Areas (non-discretionary decision). For all of the alternatives, the preservation of wilderness values within WSAs and Wilderness areas on approximately 354,015 acres preclude any activities that could degrade or cause the loss of wilderness values. No woodland harvest is allowed within Wilderness Study Areas or Wilderness Areas.

4.3.20.3.4.2 Alternative A

ACECs. Under the No Action Alternative, there are no ACECs designated, resulting in no impacts to woodland products harvesting from decisions associated with ACECs.

Wild and Scenic River Segments. Under this alternative, 24 miles of river segments along the Colorado River (segments 1, 2, and 3) and 22 miles along the three segments of the Dolores River would be recommended as eligible. Until suitability determinations were made, the segments would be managed to protect their outstandingly remarkable values (ORVs). Protection of these river segments would prohibit harvesting, which would have long-term, adverse impacts on woodland resources because harvesting would not be permitted in woodland areas along the 46 miles of river corridor.

4.3.20.3.4.3 Alternative B

ACECs. Under Alternative B, approximately 55,050 acres would be managed to preserve the relevant and important values within the proposed ACECs (Behind the Rocks, Bookcliffs, Colorado River, Labyrinth Canyon, Mill Creek, Upper Courthouse, Westwater Canyon, White Wash, Wilson Arch), including prohibitions on woodland products harvesting. Compared to Alternative A, this alternative would prohibit woodland harvesting within a larger area of the MPA and would have more long-term, adverse impacts to availability of woodland resources.

4.3.20.3.4.4 Alternative C

ACECs. Alternative C would prohibit woodland resource harvesting on approximately 15,498 acres within the MPA ACECs. This area represents less than 2% of the MPA, and the impacts on woodland harvesting would be adverse in the long-term, but minor because the area of impact would be relatively small in comparison to the total MPA.

4.3.20.3.4.5 Alternative D

ACECs. No ACECs would be designated under this alternative. Table 4.155 illustrates acres closed to Woodland Harvesting within Potential ACECs, by alternative.

Table 4.155. Acres Closed to Woodland Harvesting within Potential ACECs

	Alternative A	Alternative B	Alternative C	Alternative D
ACEC acres closed to woodland harvesting	0[1]	55,050	15,478	0

[1] Represent total acres of proposed ACECs by alternative.

4.3.20.3.5 Impacts of Woodlands Decisions on Woodlands Resources

4.3.20.3.5.1 Alternative A

Woodland harvesting would be used to support fire management goals of fuels reductions, and harvesting and salvage would be allowed in beetle-kill areas. The management actions for woodland resources under this alternative would have long-term, direct, beneficial impacts on the resource by: 1) permitting selective harvesting and salvage that would reduce the risks of stand-destroying wildland fire (and reduce the potential for long-term loss of the resource and woodland productivity) in the MPA; and 2) improving woodland resource conditions through selective removal of dead and diseased trees, and selective thinning of dense stands of woodlands.

4.3.20.3.5.2 Alternative B

This alternative would have similar beneficial impacts as discussed under Alternative A, but to a lesser degree, because fewer acres would be managed for harvesting and salvage (Table 4.156).

Table 4.156. Woodland Acres in the MPA

	Alternative A	Alternative B	Alternative C	Alternative D
Open to Woodland Harvesting	1,243,734	958,124	1,168,988	1,243,734
Actual Woodland Coverage in Open Areas	437,216 (35% of Open Area)	329,895 (31% of Open Area)	411,905 (34% of Open Area)	437,216 (35% of Open Area)
Closed to Harvesting	609,385	863,250	652,386	609,385

4.3.20.3.5.3 Alternative C

Alternative C would have similar beneficial impacts as discussed under Alternative A, but to a slightly lesser degree, because relatively fewer acres would be available for harvesting and salvage (see Table 156). The adverse restriction-related impacts to harvesting discussed under Alternative B would be the same for Alternative C. The comparison of this alternative to Alternative A would be the same as discussed for Alternative B.

4.3.20.3.5.4 Alternative D

The impacts on woodland resources under this alternative would be the same as those discussed under the Alternative A as both alternatives would manage the same number of acres for woodland harvesting, salvage, and wood gathering and the same number of acres for exclusion from these activities.

4.3.20.4 Summary of Impacts

Table 2.2 (of Chapter 2) summarizes the impacts of the various alternatives and their program actions on woodland resources.

4.3.21 Unavoidable Adverse Impacts

Unavoidable adverse impacts are those that remain following the implementation of mitigation measures or impacts for which there are no mitigation measures. Mitigation measures include stipulations and the BMPs specified for the RMP alternatives. They also include compliance with the applicable laws, regulations, policies, and guidelines. Furthermore, implementation decisions require project-specific planning and NEPA analysis where additional mitigation measures are imposed as conditions of approval.

Some unavoidable adverse impacts would occur as a result of implementing the decisions in the RMP. Implementation decisions require appropriate project-specific planning and NEPA analysis and constitute BLM's final approval authorizing on-the-ground activities to proceed.

Surface-disturbing activities (e.g., construction of well pads and roads, pits and reservoirs, pipelines and powerlines, mining, and vegetation treatments), OHV use, fire management and ecology, some recreational activities, and operation and maintenance of existing facilities and infrastructure in the MPA will cause fugitive dust, exhaust emissions, and smoke, thereby adversely impacting air quality.

Surface-disturbing activities, OHV use, fire management and ecology, some recreational activities, uncontrolled animal concentrations, and operation and maintenance of existing facilities and infrastructure in the MPA may cause soil erosion and soil compaction. These same activities, in combination with precipitation events, also may result in runoff and sedimentation to existing surface waters. Additional unavoidable adverse impacts from these activities include transport and spread of noxious weeds in the MPA. Noxious weeds will continue to spread via the wind, in water courses, and by attaching to livestock, wildlife, humans, and vehicles. The presence of noxious weeds in the MPA is considered an unavoidable impact.

Surface-disturbing activities and the development of mineral, energy, and other facilities in the MPA are expected to cause the unavoidable degradation, loss, and fragmentation of habitats. OHV use, fire management and ecology, some recreational activities, concentrated livestock grazing, and operation and maintenance of existing facilities and infrastructure in the MPA may contribute to the unavoidable degradation, loss, and fragmentation of wildlife habitats.

Protection of some resource values (e.g., wildlife, special status species, cultural, and paleontological resources) will adversely impact the use of other resources, such as minerals and renewable energy. Conversely, use of minerals and renewable energy are expected to adversely impact the distribution of some wildlife, special status species, and vegetative communities.

Minerals exploration and development, rights-of-way development, road and trail construction, fence and water developments, and mechanical vegetation manipulation would cause unavoidable adverse impacts on the natural character of the planning area as well as on opportunities for solitude and primitive recreation that would not be mitigated through project location and design.

Surface-disturbing activities and development from BLM actions unavoidably will change the landscape, scenic quality and setting in the MPA. Non-BLM actions on lands adjacent to BLM administered lands also will change the landscape and setting. Fire, insect and disease damage, and development also are expected to temporarily impact the scenic quality of the MPA. Surface disturbing activities, OHV use, vandalism, and natural processes (e.g., fire and erosion) may adversely impact cultural and paleontological resources in the MPA.

There would continue to be impacts to cultural and paleontological resources associated with dispersed recreation activities, OHV use, vandalism, and other types of activities not authorized by the BLM. Unavoidable damage to cultural resources from permitted activities could occur if resources undetected during surveys were identified during ground disturbing activities. In these instances, further impacts would be ceased upon discovery and the resource would be mitigated to minimize data loss.

4.3.22 Short-term Use Versus Long-term Productivity

Short term use is defined as activities that occur within a time frame of 1 to 5 years. Long term productivity is defined as a time frame of over 5 years and within the life of the plan (15 to 20 years).

4.3.22.1 Air Quality

Prescribed fire may result in short and long-term (to a lesser degree) degradation of air quality through increases in wind-borne particulate (PM_{10} and $PM_{2.5}$) due to loss of vegetation. Such degradation is not projected to be substantial if revegetation measures are adequately monitored and supported for regrowth.

Adverse impacts to air quality are not projected to occur under any of the proposed mineral development alternatives.

4.3.22.2 Cultural Resources

Following the Section 106 process and standard BLM policy would generally maintain the long-term productivity (i.e., the availability or presence) of cultural sites in the project area.

4.3.22.3 Fire Management

The unavoidable impacts described above would potentially impact the long-term efficiency of fire management in the MPA. However, if non-surface-disturbing vegetation treatments and fire suppression were effectively implemented, they would not result in a long-term loss of key ecosystem components or the long-term productivity of natural resources in the MPA.

4.3.22.4 Health and Safety

There would be no loss in either short-term or long-term productivity as they relate to hazardous materials.

4.3.22.5 Lands and Realty

There would be no loss of long-term productivity from short-term uses.

4.3.22.6 Livestock Grazing

Management of some resources would cause short-term detriment to livestock grazing but would eventually be a benefit to the resource and contribute to long-term productivity of rangeland resources. Vegetation treatments would cause short-term loss of acres and AUMs available to livestock but could contribute to a greater area and amount of forage in the future. The exclusion of livestock grazing in areas to benefit wildlife or watersheds would result in a long term loss of forage for grazing.

Some management actions could possibly decrease the long-term productivity of livestock grazing, such as construction, minerals extraction, and other surface-disturbing activities that are planned to continue long-term. However, these are unlikely to eliminate the long-term productivity of livestock forage in the MPA for the foreseeable future.

4.3.22.7 Minerals

Once fossil fuel and mineral resources are extracted and the short-term, beneficial uses (e.g., increased supply of minerals to meet demand, increased royalties) are realized, the resources would no longer be available for long-term or future production.

4.3.22.8 Non-WSA Lands with Wilderness Characteristics

The construction of oil and gas exploration or coal-bed methane access roads and well pads would produce a long-term loss of naturalness and opportunities for solitude and primitive recreation in producing areas and other locations where reclamation is problematic or unsuccessful. The effects of prescribed fire for vegetation treatments would, in the long-term, enhance vegetation condition and the natural character of non-WSA lands. A more natural landscape would improve opportunities for both solitude and primitive forms of recreation. Further, construction of riparian fences or new water developments, would degrade the natural character of non-WSA lands in the short term, but enhance the riparian vegetation community in

the long term, providing for a more natural landscape and settings for primitive recreational activities.

Other long-term activities that would degrade wilderness characteristics include above-ground rights-of-ways and powerline corridors, construction of roads and trails, and allocation of areas and routes to motorized vehicle use. Further, implementation of these structures, land treatments, and uses would change the natural setting to a more developed and industrial landscape that is not conducive to primitive recreation activities and experiences of solitude. Land and vegetation disturbance, the presence of human-made structures on the land, and the noise and presence of people, equipment, and vehicles does not support an experience of solitude and conflicts with primitive recreational activities

4.3.22.9 Paleontological Resources

Short-term uses of BLM lands for activities involving surface-disturbance or increased public access would have long-term impacts on non-renewable paleontological resources. In paleontologically sensitive areas/geologic units, surface-disturbing activities affecting paleontological resources would include mineral development including oil and gas, trampling by livestock, and the construction of infrastructure such as roads, trails, reservoirs, buildings, and fire lines. Travel decisions involving OHV use would also have long-term adverse impacts on paleontological resources in sensitive areas/geologic units. Enhancing or restricting public access due to resource conflicts would create the potential for long-term impacts, either adverse or beneficial. In most cases, implementation of paleontological mitigation measures would reduce adverse impacts to below the level of significance, and result in beneficial impacts by salvaging and preserving fossils that otherwise may have never been discovered in a public museum where they would be permanently available for scientific research, education, and public display. Accordingly, these long-term impacts would not result in a loss of the long-term productivity of this resource.

4.3.22.10 Recreation

Recreation users can be displaced or their experiences or desired outcomes can be substantially interfered with by other land uses. Short term uses such as mineral exploration could disrupt recreation users for a short term. However, long-term disturbance of areas for mineral development could affect the long-term use of some lands for certain recreation users.

4.3.22.11 Riparian Resources

The short-term use of riparian areas for recreation and livestock grazing would not impact the long-term productivity as long as Utah BLM Standards for Rangeland Health are met, thereby reducing or eliminating effects of those actions known to cause degradation of riparian habitat or loss of PFC. Short-term use of riparian areas for utility corridors would impact the long-term productivity of riparian resources where infrastructure replaces riparian resources or alters its physical or biological processes.

4.3.22.12 Socioeconomic Resources

Short-term use of resources in the MPA would have negligible impacts on the long-term social and economic health and stability in Grand and San Juan Counties.

4.3.22.13 Soils and Water Resources

Short-term uses that cause surface disturbance of sensitive soils—including improper livestock grazing, recreation and travel, fire management, and minerals development—would result in reduction of long-term soil productivity due to the reclamation limitations of these soils and in a propensity for erosion.

4.3.22.14 Special Designations

Any loss of relevant and important values within potential ACECs, or outstanding remarkable values in WSRs, would persist throughout the life of the RMP, and would constitute a long-term loss of these values as a result of short-term uses.

4.3.22.15 Special Status Species

As discussed throughout this section, some of the short term, multiple uses of the MPA are likely to impact or reduce SS species populations and/or their habitat. These uses include oil and gas development, improper livestock grazing, camping, off-road vehicle travel and woodland harvest. Most of these impacts would be partially mitigated by the actions discussed in the Management Common to All sections for each management decision. Implementation of these conservation measures, as well as adherence to BLM requirements and the Endangered Species Act would prevent these short-term resource uses from substantially impacting the long term productivity of SS species habitat in the MPA.

4.3.22.16 Travel Management

Future actions to control fuel loading and to manipulate vegetation could have short-term impacts by restricting travel in treatment areas. Limiting use to designated routes would result in perceived short term loss of access, but long term access on designated routes would be maintained due to decreases in impacts to other resource values. Otherwise, short-term use of resources in the MPA would have no impact on the long-term productivity of travel.

4.3.22.17 Vegetation

As discussed throughout this section, some of the short-term, multiple uses of the MPA would negatively impact the short-term productivity of native vegetation. These uses include oil and gas development, improper livestock grazing, camping, off-road vehicle travel, and woodland harvest. These impacts, however, provide economic benefits, and would be partially mitigated by the protective measures discussed in the Management Common to All sections for each management decision. Effective implementation of these protective measures would prevent these uses from substantially impacting the long-term productivity of these resources.

4.3.22.18 VISUAL RESOURCES

Disturbance due to vegetation treatments for fire management, facility/campground construction, minerals exploration and development, and exotic species control would have short-term adverse impacts on visual resources. However, some of these activities would also have long-term, beneficial impacts on visual resources and scenic quality by reducing the potential for visual quality degradation from wildland fire, or by producing variations in the vegetation mosaic that would create a more diverse (and a potentially more visually interesting) landscape. Reclamation of minerals-related surface disturbances would reduce the impacts to the short-term. However, long term mineral development would impact the long-term productivity of visual resources in visually sensitive areas.

4.3.22.19 WILDLIFE AND FISHERIES RESOURCES

Short-term, multiple uses of the MPA would negatively impact wildlife habitats. These uses include oil and gas development, improper livestock grazing, dispersed and developed camping, off-road vehicle travel, and woodland harvest. Permanent alteration of wildlife habitat due to clearing activities such as oil well pad installation and woodland harvest would constitute long-term adverse impacts on wildlife.

Most of these impacts would be partially mitigated by the protective measures discussed in the Management Common to All Alternatives sections for each management decision. Effective implementation of these protective measures would prevent these uses from substantially impacting the long-term productivity of wildlife and fisheries resources.

Short-term uses of BLM lands for some permitted activities could affect the long-term sustainability of some special status species habitat. Uses could affect species by displacing animals or removing plants from primary habitats and removing components of these habitats which may not be restored for greater than 20 years. For example, since translocation of sage-grouse between populations has not proven successful, long-term loss of sage-grouse habitat due to the oil and gas development and other mineral activity could result in the displacement and/or loss of localized sage-grouse populations.

4.3.22.20 WOODLANDS

Short-term uses that could affect the long-term productivity of woodland resources would include those activities that inhibit the re-establishment and renewal of woodland resources. Short-term uses that could adversely impact the long-term productivity of woodland resources include 1) fuels reduction treatments that could limit woodland resources productivity and could have short-term adverse impacts on woodlands harvesting from restrictions placed on entry into fuels reduction-treated areas, and 2) failure to prevent noxious weed invasion and establishment after woodland treatment or other surface disturbances, which could adversely alter successional patterns and fire regimes that favor non-woodland vegetation.

4.3.23 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment of a resource results where the resource is permanently lost and can not be recovered. For example, the production of oil and gas is an irreversible commitment of these resources. An irretrievable commitment of a resource results in the loss of a resource or its use for a period of time. For example, the loss of vegetation in construction of a well pad would result in an irretrievable commitment of this resource until the area can be reclaimed or restored.

4.3.23.1 CULTURAL RESOURCES

Because the location and nature of all cultural resources in the area under consideration are unknown, it is not possible to determine the amount or level of irreversible and/or irretrievable impacts to cultural resources in the MPA. However, it is likely that, in spite of Section 106 of the NHPA and BLM policy and guidelines, some non-mitigatable impacts would occur and would likely be irreversible since restoration of an archaeological site is typically very difficult.

4.3.23.2 FIRE MANAGEMENT

The prohibition of fuels reduction and vegetation treatments could result in irretrievable increases in fire suppression costs, as well as irretrievable losses in habitat value as vegetation types move away from DWFC. However, non surface-disturbing vegetation treatments and/or effective suppression followed by effective rehabilitation/restoration could prevent these impacts from being irreversible. However, it should be noted that reactive fire management (fire suppression and rehabilitation) is typically more expensive, time-consuming, and damaging than proactive fire, fuels, and vegetation management (prescribed burns, mechanical thinning, chemical treatment, and subsequent restoration).

4.3.23.3 LANDS AND REALTY

All alternatives permit Land Tenure Adjustments (sales, exchanges) that may result in the permanent loss of lands from public ownership if they enter State or private ownership.

4.3.23.4 LIVESTOCK GRAZING

Areas not available for livestock grazing would result in an irretrievable loss of forage for livestock under the life of the plan. Also, vegetation treatments, prescribe burns, and wildland fire would result in an irretrievable loss of vegetation and forage for livestock grazing until the vegetation is restored.

4.3.23.5 MINERALS

The extraction and development of mineral resources from the MPA would result in both an irreversible and irretrievable loss of those mineral resources due to the finite nature of the resource. The impacts would be irretrievable and irreversible because once extracted, the mineral resource cannot be used again, nor can it be replaced in the foreseeable future.

4.3.23.6 Non-WSA Lands with Wilderness Characteristics

Any loss of naturalness and/or solitude within non-WSA lands with wilderness characteristics due to surface disturbing activities such as mineral development, wood harvest, and cross county OHV use would be irretrievable until the impact area was fully reclaimed. The scenic quality of areas with scenic values could be degraded over the life of the plan.

4.3.23.7 Recreation

There would be no irreversible (i.e., unrestorable) losses of recreation resources for any of the alternatives. Irretrievable impacts to recreation resources would be caused by 1) short-term loss or diminishing of recreation-related scenic quality from vegetation treatments, fuel reductions, or invasive weed control until vegetation re-growth; and 2) short-term irretrievable loss of scenic recreational opportunities due to mineral development until disturbances are reclaimed.

4.3.23.8 Riparian Resources

Irretrievable loss of riparian habitat could occur due to grazing, visitor trampling, and construction-related removal of riparian habitat. However, this habitat could eventually be restored, so those impacts would not be irreversible. It is possible that noxious weed infestation of disturbed riparian areas could become an irreversible impact based on past difficulties in controlling invasive species, such as tamarisk and Russian olive, in riparian habitat. An irretrievable loss of riparian habitat could also occur if riparian habitat is converted to upland habitat (by filling, draining, or other landscape alterations) in association with the placement of utility corridor infrastructure.

4.3.23.9 Soils and Water Resources

Where surface-disturbing activities occur and are not mitigated, an irreversible loss of soil and soil productivity would result. Where surface disturbance affects sensitive soils, the impacts would be irretrievable in the long term, due to these soils' limitations. Either of these types of impacts may result from livestock grazing, minerals development, or recreation or travel (including the use of OHVs).

4.3.23.10 Special Designations

Any loss of relevant and important values within potential ACECs, or outstanding remarkable values of potential WSRs, due to surface disturbing activities such as mineral development and cross county OHV use would be irretrievable until the impact area was fully reclaimed. The scenic quality of areas with scenic values could be degraded over the life of the plan.

4.3.23.11 Special Status Species

Irretrievable impacts associated with surface disturbing activities proposed throughout the MPA include the loss of SS species habitat value from mineral development, fire treatments, or OHV use. These resource values would be lost until successful restoration/rehabilitation takes place.

The protective measures detailed in the Summary Table of Alternatives, Chapter 2, and Appendix O requires reclamation of disturbed areas following completion of management actions (i.e., well pad deconstruction, reseeding and weed eradication in over-grazed areas). Implementation of this reclamation/rehabilitation would prevent these impacts from being irreversible.

4.3.23.12 TRAVEL MANAGEMENT

All routes not designated would be irretrievable in that the use of that travel resource would be irretrievably lost until the routes were designated for use. However, none of these non-designations would be irreversible, in that it is possible to make these routes available for use again subject to additional analysis and/or adaptive management response.

4.3.23.13 VEGETATION

The protective measures detailed in Chapter 2 require the reclamation of disturbed areas following completion of the management action (i.e., well pad deconstruction, reseeding and weed eradication in over-grazed areas). Because vegetation resources would be restored or rehabilitated after proposed disturbance and/or development, there would be no anticipated irreversible impacts on native vegetation resources associated with the management decisions proposed for the MPA. There would be, however, irretrievable impacts associated with surface-disturbing activities proposed throughout the MPA.

4.3.23.14 VISUAL RESOURCES

Irretrievable impacts to visual resources would also be produced by surface disturbances such as mineral development, access road construction, facility construction, fire management, and vegetation treatments. This irretrievable loss would be most apparent in those areas of particular visual sensitivity noted above and under those alternatives that propose lower visual protections for those areas. The visual resources impacted by such developments would be irretrievably lost until those areas are rehabilitated or restored. However, because they can be restored, these impacts would not be irreversible.

4.3.24 CUMULATIVE IMPACTS

Cumulative impacts occur when there are multiple impacts on the same resources. These are incremental impacts of proposed activities or projects when combined with past, present, and future actions. As stated in 40 CFR 1508.7 (1997), a "cumulative impact" is the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Resource decisions from this RMP could combine with other past, present, and reasonably foreseeable future actions to produce cumulative impacts to resources within the MPA. Co-occurring planning projects in the region that would contribute to cumulative impacts include the

Manti-La Sal National Forest and the BLM Monticello, Price, and Vernal RMPs. Also, similar management direction and resource uses would occur in the adjacent BLM Field Offices in Colorado. Activities on Utah School and Institutional Trust Land Administration lands (SITLA), private lands, and City and County use plans for surrounding communities could have cumulative impacts where land is developed adjacent to BLM lands.

4.3.24.1 AIR QUALITY

Activities contributing to cumulative impacts to air quality include prescribed burning; construction, equipment operation, and surface-disturbing activities related to oil and gas development; and OHV activity throughout most of the MPA.

Short-term cumulative impacts from the activities proposed for all resource decisions on air quality are projected to be minimal to negligible under all alternatives. Direct and indirect short-term impacts include increases in airborne particulate and gaseous emissions from prescribed burning, construction sites, and/or OHV trails/use areas. Short-term cumulative impacts are expected to be small as vegetation and fugitive dust management would be an active part of fire management and oil and gas development techniques in both planning areas. Assuming appropriate application of control measures and strict adherence to existing regulatory and permitting processes, no appreciable cumulative, short-term, adverse air-quality effects are projected specific to oil and gas development. OHV related air-quality impacts are expected to be very short-term and site-specific in nature and are not projected to affect the wider planning area.

Long-term cumulative impacts from the activities proposed for all resource decisions on air quality are also projected to be minimal to negligible under all alternatives. Direct and indirect long-term cumulative impacts include increases in particulate and gaseous emissions from equipment specific to oil and gas development, and associated use of service roads. Detrimental effects from oil and gas development are expected to be small as emissions and fugitive dust control would be a required part of the permitting process. No appreciable cumulative, long-term, adverse air-quality effects are projected for oil and gas development assuming the conditions described under short-term cumulative impacts.

4.3.24.2 CULTURAL RESOURCES

Impacts associated with resource decisions from this RMP, combined with other past, present, and reasonably foreseeable actions, could produce cumulative impacts on cultural resources and resources of religious or traditional importance to Native American tribes associated with the decision area. The potential for cumulative impacts includes neighboring lands with connected cultural resources including adjoining BLM Field Offices, state and private lands within the planning area, the Uintah and Ouray Indian Reservation, and the Manti-LaSal National Forest. The same general management direction and resource uses occur on all BLM managed lands and the Forest Service. Surface disturbing activities such as mineral development taking place across the region can contribute to cumulative impacts of cultural resources. However, these activities would require adherence to cultural resource laws an regulations, resulting in the inventory and identification of cultural sites, avoidance, and in some cases data recovery.

Oil and gas development and mineral exploration and development has occurred across this region in the past and would continue into the future, both on BLM lands under the RMP and on state and private inholdings. Minerals development of inholdings and lands adjacent to the MPA will continue to increase the human presence in the general area, thereby increasing the risk to cultural resources from looting, vandalism, and inadvertent impacts. However, the cumulative impacts of these activities on cultural resources in the general vicinity of the planning area would likely be less than the potential impacts from the continually increasing recreational visitation that cultural sites in the region are subject to; recreational activity in and around the MPA would continue to increase regardless of which alternative the BLM selects for its RMP. The advent of the internet has resulted in the wide publicizing of the locations and types of cultural resources in and around the planning area. This, combined with handheld GPS technology and the easy and rapid access afforded by the substantial increase in OHV ownership and recreational use, will continue to subject cultural resources in the region to heightened risk of damage, vandalism, and/or looting.

Many decisions related to visual resource management, special designations, and restrictions on surface disturbance have the potential to provide a net positive benefit to cultural resources within the MPA. These decisions would reduce or control the frequency and extent of ground-disturbing activities that present the greatest threat to maintaining the use values of cultural resources. In general, all minerals and recreation decisions under all alternatives have the potential to increase or at least maintain current levels of adverse impacts to cultural resources. Decisions for minerals and recreation generally increase or maintain current levels of surface and subsurface disturbance and have as an indirect effect an increase in human activity within those areas of minerals development and recreational use. Increased human activity tends to equate with increased adverse impacts to cultural resources, even if these impacts are inadvertent.

In general, implementation of the array of resource decisions under Alternative B would have the lowest degree of potential negative impact on cultural resources within the MPA, and in many cases Alternative B has the highest overall benefit for cultural resources. Overall, fewer acres of land would be open for ground-disturbing activities under this alternative than under any other alternative. Although no direct correlation exists between acres of surface and subsurface disturbance and numbers of cultural resources impacted, this general trend holds true. By comparison, Alternative D and Alternative A have the potential for roughly comparable levels of potential adverse impact to cultural resources. Decisions under Alternative C would have an intermediate potential for adverse impacts. Under all alternatives, specific undertakings that could result in surface and subsurface disturbance and have the potential to impact cultural resources are subject to the Section 106 process of the NHPA which calls for the identification of historic properties (i.e., National Register listed sites or sites determined eligible for listing on the National Register) within the area of potential effects and the consideration of alternatives to the planned undertaking that could avoid impacts to said properties. In the event that avoidance is not possible, mitigation of the impacts is to be considered.

4.3.24.3 HEALTH AND SAFETY

Cumulative impacts would be the same under all of the alternatives. The potential impacts would be due to management actions and planning within those lands surrounding the MPA, including

the Vernal, Price, Monticello, Grand Junction, Montrose and Durango BLM offices, Arches and Canyonlands National Parks and the Manti-LaSal National Forest. Minerals development within surrounding areas would increase the use, generation and transportation of hazardous materials. City and County use plans for surrounding communities could have cumulative effects, whereby mineral resources are development adjacent to BLM lands. State lands, including SITLA, that are surrounded by BLM land could have impacts from inholding development.

Hazardous materials are regulated by the EPA and administered by state agencies regardless of land status. If all applicable laws, regulations, safeguards, and procedures were followed, there would be no cumulative impacts caused by hazardous materials.

4.3.24.4 Lands and Realty

The number of land use authorizations, particularly rights-of-way and permits, is a function of demand for these uses. Additional future development of adjacent Federal, state, and private lands would likely result in additional requests for and approval of land use authorizations for facilities such as roads, utilities, and communication sites.

City and County use plans could have cumulative impacts where land is developed adjacent to BLM lands. Both the Grand and San Juan County Use Plans have a no net loss of private land as a result of government agency land ownership adjustments. Even though land exchange would be the preferred means of land ownership adjustment, such a position could affect the land ownership adjustment program by more strongly favoring land exchanges and outright disposals of public land over purchases of private land.

The designation of right-of-way avoidance and exclusion areas on BLM lands, along with similar restrictions on right-of-way development on adjacent lands, particularly National Forest lands, would have a cumulative impact of reducing routing options for right-of-way facilities such as utilities and roads. Alternative B has the most avoidance and exclusion areas followed next by Alternative C.

4.3.24.5 Livestock Grazing

Cumulative impacts to livestock and grazing could result from activities on adjacent private lands, activities scheduled for Utah School and Institutional Trust Land Administration lands, and administrative actions on adjacent National Forest System lands. These effects could be both positive and negative on the livestock grazing resource.

It is likely that adjacent lands would see an increase in land uses (such as development and recreation) that may influence available resources within the MPA in the future. These factors may increase the demand for grazable land which in turn could create scarcity within BLM lands. However, since the number of allotted grazing permits in the project area is fixed for the life of the plan, this increased demand would not result in a decrease in rangeland quality in the 15 years following the implementation of the plan.

Any past, present, or future land uses in the surrounding areas that degrade ecological function in the planning area could reduce forage quality for livestock. Increased construction or energy exploration in the area could result in the introduction of disturbance-colonizing weed species, which could decrease forage quality in the MPA. For example, some weed species such as halogeton (*Halogeton glomeratus*) that occur in response to land disturbance are toxic to sheep and could cause mortality if ingested in large quantities.

The following resource decisions have no foreseeable impacts to livestock grazing: air quality, human health and safety, paleontology, Special Designations (ACEC, Wild and Scenic Rivers, Wilderness), Special Status Species, Visual, Wilderness Characteristics and Woodlands.

4.3.24.6 MINERALS

The restrictions imposed by resource programs under the different alternatives for the RMP result in impacts to mineral development. For oil and gas, the restrictions include closed to leasing along with no surface occupancy, controlled surface use, and timing limitation stipulations. These restrictions reduce the unrestricted number of wells that were projected in the Reasonably Foreseeable Development scenario for oil and gas. In general, the restrictions also increase development costs and reduce production. An average of 600 wells is projected on all lands (State, Forest Service, private) within the MPA over the next 15 years when no restrictions are applied.

The restrictions identified above are not applied to non-Federal (state and private) wells. While other restrictions may be applied to non-Federal wells, the impact of such restrictions cannot be quantified for this analysis. Similar restrictions could be applied on the Manti La Sal National Forest but the potential for oil and gas development is low. The projections of well numbers under each alternative as compared to the baseline is as follows:

Baseline - 600; Alt A - 452; Alt B - 255; Alt C - 432; Alt D - 448

The impacts to leasable and salable minerals are projected to be minimal across all the alternatives.

4.3.24.7 NON-WSA LANDS WITH WILDERNESS CHARACTERISTICS

The analysis of cumulative impacts for areas with wilderness characteristics (designated wilderness, WSAs, and areas identified with wilderness characteristics) includes all Federal lands with wilderness characteristics in Utah that are currently being managed for management of wilderness characteristics to protect those values. Under Alternative B, wilderness characteristics would be maintained on 266,485 acres. This would make the statewide total of Federal lands where wilderness characteristics are protected by law or administrative decision to 5,932,521 acres or about 4.5% of the statewide total. Under Alternative C, wilderness characteristics would be maintained on 47,761 acres. This would make the statewide total of Federal lands where wilderness characteristics are protected by law or administrative decision to 5,713,797 or about 0.8% of the statewide total. Alternatives A and D would contribute to the loss of areas with wilderness characteristics in the region.

4.3.24.8 PALEONTOLOGICAL RESOURCES

Unauthorized activities such as OHV use, dispersed recreation, and vandalism would continue to have adverse impacts to paleontological resources under all alternatives. These impacts would be reduced under Alternative B and to a lesser extent under Alternative C because they provide more constraints on OHV use and dispersed recreation activities. There would also be impacts as a result of permitted surface disturbing activities such as mineral development in areas containing significant paleontological resources. The potential for inadvertent adverse impacts to paleontological resources from surface disturbing activities would be greater under Alternatives A and D. However, existing laws, regulations, and policies provide for mitigation through avoidance or data recovery efforts. Although it is expected that some fossils would be destroyed in the course of legitimate uses of public lands, mitigation measures would likely bring paleontologist to areas where fossils had not been previously studied. Thus, fossils that would otherwise have disintegrated over time due to weathering and erosion would be collected, placed in repositories, and protected in perpetuity. Cumulative impacts on paleontological resources could occur through incremental degradation of the resource base by a variety of sources, reducing the information and interpretive potential of the paleontological resources in the region. Activities on lands that are not protected by Federal laws or policies protecting paleontological resources could decrease the regional resource base, increasing the scientific value of the paleontological resources within the decision area.

4.3.24.9 RECREATION

Past and present actions that have had and are having impacts on recreation include mineral development, wildland fire suppression and fuels treatments, OHV travel, utility corridor development, grazing and recreational activities in riparian areas, and management within existing SRMAs and the ERMA. Reasonably foreseeable future or potential prescriptions and impacts on recreation are included in each of the resources discussed in this section. Other administrative agencies, including the Forest Service and adjacent BLM FOs, and state and local agencies contribute to the cumulative impacts.

The potential cumulative impacts on recreation from actions within the MPA and adjacent and local administrative agencies are:

- Oil, gas, locatable, and salable minerals exploration and development could have a long-term, cumulative effect on the recreational viewshed from surface disturbances and facilities. VRM mitigation would reduce these effects, but it is likely that the activities would remain visible from points of view within the MPA and from viewpoints within the adjacent National Parks.
- Wildland fire suppression would temporarily affect recreation use in or adjacent to areas where prescribed fire or other vegetation treatments are being conducted. The long-term cumulative effects would reduce fire risks to recreation area and facilities within the MPA and on lands under other administrative agencies. Prescribed burning would temporarily degrade air quality (and scenic quality), but with the reduced risks of wildland fire, there would be a cumulative decrease in smoke emissions.

- OHV travel management would have beneficial cumulative effects on recreational experiences and resources by reducing surface impacts to soils, cultural resources, riparian areas, and wildlife habitat by generally confining travel to designated routes within the MPA. The reduction in OHV-related surface disturbances would also cumulatively reduce the spread and establishment of exotic, invasive plant species.
- Riparian areas would be beneficially affected by cumulative actions to improve ecological conditions within these sensitive areas, which would improve recreation experiences for wildlife viewing, camping, and hiking.
- The cumulative effect on recreation resources would be enhanced in the long-term by managing existing and proposed SRMAs and the ERMA in the MPA and in adjacent BLM FOs (Price, Monticello). The designation of SRMAs would help to reduce the conflicts between the different recreation uses. The cumulative effect of managing the MPA to respond to the expected increase in visitation, changes in recreational demand, and the wide range of recreational activities would have beneficial effects on recreation.

Cumulative impacts on recreation opportunities, setting and experience would be greater under Alternatives A and D, as restrictions on surface development and protections afforded to natural resources within the planning area would be less intensive under these alternatives. Alternative B would provide the greatest protection to natural resources and the highest level of non-motorized recreation opportunities. There would be an intermediate amount of cumulative impacts to recreation under Alternative C.

4.3.24.10 Riparian Resources

Past and present actions within the MPA and on adjacent USFS-administered lands, state lands, and private lands that affect and have affected riparian areas include livestock grazing, recreational uses (including OHVs, non-motorized recreation, etc), mineral exploration and development, and upstream water withdrawals and impoundments. In general, these actions have all had cumulatively adverse impacts on riparian health. Livestock grazing, recreation, and mineral-related activities have led to surface disturbance, soil compaction, removal of riparian vegetation, bank trampling, and alteration of riparian areas' physical structure. They have also resulting in the widespread introduction of invasive weeds. Water withdrawals and impoundments have limited the health and extent of riparian zones by decreasing water availability, and encouraged the introduction of invasive plants through the stabilization of formerly dynamic sediment deposits, such as bars and banks.

Reasonably foreseeable future actions that would affect riparian areas include an expansion of recreational use and ongoing mineral exploration, development, and extraction. All of these actions could have a potential adverse effect on riparian areas. Beneficial impacts would result from Forest Service planning efforts, which will reduce negative impacts to riparian resources on National Forest lands. Future impacts on private lands may include both positive and negative impacts as described above.

Under all alternatives, riparian resources would benefit from management for PFC, in accordance with the Utah Standards for Public Rangeland Health for BLM Lands in Utah and with the Grazing Guidelines for Grazing Management. Adherence with these plans would

mitigate many of the adverse impacts from past, present, and future actions. In addition, continuing closure of several allotments to grazing would continue the restoration and enhancement of riparian resources in these areas.

4.3.24.11 Socioeconomic Resources

Resource decisions from the RMP would combine with other past, present, and reasonably foreseeable actions to produce cumulative impacts to the social and economic conditions of Grand and San Juan Counties. Resource decisions for the Monticello Field Office, Arches and Canyonlands National Parks and the Manti La Sal National Forest, which are adjacent to the MPA, could potentially result in socioeconomic impacts to local communities. Changes in management actions that increase or decrease visitation to these areas could have beneficial or adverse impacts on the local economy, with regard to tourism-based revenue.

Mineral development outside the MFO's jurisdiction, but within or near the MPA could also impact social and economic conditions. According to the BLM's RFD, the total maximum amount of wells predicted to be drilled on all lands within the planning area over the life of the RMP is 600 wells. According to the Alternative A, the No Action Alternative, the maximum amount of wells projected for BLM lands is 451. Additional development of producing oil and gas wells could bring additional tax and royalty revenue to the counties, beyond the amount estimated in the analysis above. Additional jobs may be created with the production of 151 more wells, but as stated above, the amount of full-time, local residents employed by oil and gas developers is a relatively small portion of the employed population.

Additional mineral development, including the potential increase in uranium mining on non-BLM lands and the establishment of the Lisbon Valley Copper Mine, could have short and long-term beneficial impacts on local economic conditions with regard to employment and tax revenue. The Lisbon Valley Copper Mine is expected to employ approximately 145 people and produce more than 12,500 tons of ore per day (BLM 2004e). A potential increase in uranium extraction throughout the MPA could have some short-term beneficial economic impact on local communities; however, uranium development is not projected to be extensive, and therefore should not adversely impact visitor experience and recreation-related revenues.

In addition to BLM management decisions, the remediation of the Moab Uranium Mill Tailings by the Department of Energy (DOE) could potentially impact socioeconomics. Beneficial economic impacts would likely come from short and long-term increases to the regional tax base. An increased demand for temporary housing by a workforce coming in from outside the region and support services (hotels and restaurants) would bring a temporary increase in tax revenues. Direct and indirect employment related to the transport of the tailings would result in over 300 jobs and over $13,400,000 in labor earnings. Employment related to the site monitoring and ground water remediation is not anticipated to have long-term substantial impacts on local employment levels, earnings, and revenues from goods and services (DOE 2005).

Utah Department of Transportation (UDOT) is currently developing a network of bike paths and transit facilities that would provide alternative access to Moab's popular recreation sites. The project, entitled the North Moab Recreation Areas Alternative Transportation Project, is

anticipated to increase safety of visitors by separating non-motorized from motorized users, enhance visitor experience by allowing them to see the area via bicycle or walking, and benefit the environment by reducing air and noise pollution and reducing the footprint of motorized vehicles on the desert ecosystem. UDOT has estimated that the completed project would alleviate an estimated 20% of traffic congestion in the area and approximately 500,000 people would use the transit hub and non-motorized infrastructure annually. This project would likely have long-term beneficial impacts on local social and economic conditions, as the trail system would provide increased opportunities for recreation in the Moab area.

4.3.24.12 Soils and Water Resources

Past and present actions that affect and have affected soil and water resources include livestock grazing, recreational uses (including OHVs, non-motorized recreation, etc), mineral exploration and development, woodland harvest, and vegetation treatments (including those for fire management). In general, these actions have all had cumulatively adverse impacts on soil resources by causing surface disturbance contributing to reduced soil productivity, soil compaction, erosion, and subsequent sedimentation. They have also resulted in the widespread introduction of invasive weeds, which can affect water resources through increased evapotranspiration rates, and soil resources through alterations to soil chemistry and productivity. Water withdrawals and impoundments have limited water availability and quality.

Reasonably foreseeable future actions in the MPA and on Federal, state, private, and other lands within and adjacent to the MPA that would affect soils and water resources include an expansion of recreational use and ongoing mineral exploration, development, and production. All of these actions will have an adverse effect on soil and water resources in the MPA. Beneficial impacts would result from Forest Service planning efforts, which would reduce negative impacts to soils and water resources on adjacent Forest Service lands and on MPA lands adjacent to and downslope and downstream from Forest Service lands. Future impacts from private land uses may be positive or negative, as described above.

Under all alternatives, soils and water resources would benefit from management, in accordance with the Utah Standards and Guidelines for Rangeland Health. Adherence with these standards would reduce many of the adverse impacts from future actions. In general, Alternatives A and D would be the least protective of soil and water resources, result in the least beneficial impacts to soils and water resources, and have the least mitigating effect on past impacts to soils and water resources in the MPA. Alternative B would be the most protective and would provide the greatest reductions of cumulative impacts by excluding the most areas from grazing and other forms of surface disturbance, and prioritizing the most WMPs. Alternative C would provide an intermediate level of protection and mitigation of cumulative impacts although Alternative A excludes more acreage from grazing.

4.3.24.13 Special Designations

Cumulative impacts to Special Designations can result from decisions on BLM lands and State lands within the designations. Adverse impacts would occur mainly from surface disturbing activities such as mineral development and OHV use off existing roads. Direct adverse impacts

would be due to the loss of vegetation resulting in impacts to soils, wildlife habitat, and visual resources. These cumulative impacts could lead to the loss of relevant and important values for ACECs and outstanding remarkable values for Wild and Scenic Rivers. The potential for damage to the important resource values identified within proposed Special Designations is greatest for Alternatives A and D, least for Alternative B, and intermediate for Alternative C.

With congressional designation of a Wild and Scenic River, BLM would continue to manage for the ORVs, classification, and free-flowing nature of the river. Congressional designation would provide manager with mechanisms to maintain free-flowing values, protect or enhance water quality, protect ORVs, manage consistently with the wild, scenic, or recreational classifications, and where it is a management plan objective, to promote economic development, tourism, or recreational use, and to purchase property.

Congressional designation does not affect existing river compacts, nor does it provide Federal authority to regulate non-Federal lands. On navigable rivers, the bed and banks are state lands, and the Federal and state governments would collaborate on matters affecting instream flow and other river resources.

The Wild and Scenic Rivers Act implies a Federal reserved water right; however, it must be the minimal amount necessary for purposes of the Act, it must be adjudicated through State processes, and it would be junior to existing water rights. The amount of the Federal right would vary from river to river, depending on the river's flows, the then unappropriated quantities in the river, and the values for which the river is being protected. Rather than initiating efforts to secure water rights for instream flows, BLM could develop cooperative or voluntary water flow management strategies with other water users and the state. In some situations, the state may have already established minimum stream flows for fish protection or other purposes, which may be adequate to meet the wild and scenic river needs.

Designated wild rivers would be closed to mineral location. FERC would be prohibited from licensing the new construction of hydroelectric facilities "on or directly affecting" a designated WSR. The ACT also prohibits any department or agency of the United State from assisting in the construction of any water resources project that would have a "direct and adverse" effect on the values for which the river was designated. It also precludes Federal assistance to projects below/above a designated river that are determined by the administrative agency to invade the area or unreasonably diminish the scenic, recreational, and fish and wildlife values present as of the date of designation.

Please see the WSR suitability appendix for an evaluation of suitability for each river segment. A suitability finding will be made in the Record of Decision (ROD).

4.3.24.14 Special Status Species, Vegetation, and Wildlife

Surface disturbance associated with consumptive uses such as oil, gas and other minerals development, and forage use by livestock and wildlife species would result in cumulative effects over a larger landscape scale than the planning area for the Moab RMP.

Oil and gas development has occurred across this region in the past and will continue into the future. The combined amount of surface disturbance of these past, present, and future actions would be detrimental to sensitive plants and animals. The spatial layout of oil and gas facilities disturbs a large proportion of vegetation and wildlife habitat when considered across the region. Each disturbed area for a well pad increases the opportunity for weed invasions and disrupts the spatial continuity of vegetation communities, and hence, habitat for sensitive plant and animal species. Other activities such as road building and increased OHV use would increase human access to sensitive areas that SS species, vegetation, and wildlife are dependent upon for survival. For example, increased human access into prairie dog sites is likely to increase mortality by shooters and indirectly impact all the species associated with them.

The overall cumulative impact of activities proposed for all resource decisions on these resources is projected to be moderate to detrimental at localized areas within the short term, with long-term improvements for (non-special-status) vegetation and wildlife habitat. Major contributors include OHV activities throughout most of the area; habitat destruction from mineral development related activities; some vegetation treatments such as sagebrush removal; and possible livestock water developments resulting in redistribution of livestock into previously unused areas that are sensitive to disturbance. Direct impacts would be due to loss of individual sensitive plants or animals from mineral, oil, and gas related development. Indirect impacts would also occur with habitat fragmentation due to development, changes in OHV use due to increased roads, and rock/fossil collection. These activities would concentrate grazing pressures and recreation use on habitat sites for some plant and wildlife species. The conversion of land use from agricultural lands to residential and commercial uses would increase the habitat values of undeveloped land. The change in land use could result in the loss of habitat for some wildlife species. The cumulative impacts of all these uses could lead to lower populations of sensitive (and non-sensitive) plants and animals in the future. In addition, some SS species may be pushed closer to listing or extinction from the cumulative degradation of BLM lands in the long term. Beneficial impacts would be obtained with designation of proposed ACECs and management for wilderness characteristics, because numerous plant populations and wildlife habitats would be given special management protection within the boundaries of those designated areas.

4.3.24.15 Travel Management

Past, present, and future actions impacting travel management include the addition of routes for fire and fuels management to reduce the risks of wildland fire, vegetation treatments to control invasive species, new minerals exploration and development routes, managing for increasing recreational demand and visitation by adding new routes, and other changes in travel management; however, these actions would likely be minor.

Transportation and road networks adjacent to BLM lands include routes shared with other Federal agencies, SITLA, and private landowners. Cumulative impacts to transportation and access would occur primarily from actions that facilitate, restrict or preclude motorized access. Management actions that restrict OHV use would limit the degree of travel opportunities and the ability to access certain portions of the planning area. The continued maintenance of Federal and state highways would provide arterial connections to BLM roads. County maintained routes that

connect Federal and state highways to BLM-system routes would maintain and improve access to the MPA's resources.

4.3.24.16 Visual Resources

4.3.24.16.1 Alternative A

Past and present actions causing cumulative impacts to visual resources include fire suppression, minimal fuels treatments, and minimal prescribed fire treatments, resulting in a buildup of hazardous fuels materials. Minerals exploration, development, and extraction have been and are being conducted within the MPA, producing surface disturbances within the MPA. The demand for recreational opportunities has been and is presently intensifying resulting in impacts to backcountry and frontcountry recreation areas as visitors expand into previously undisturbed areas of the MPA.

Reasonably foreseeable future actions include vegetation treatments to reduce fuel loading and to improve vegetation community and enhance wildlife habitat. Recreational activity and use within the MPA is expected to increase, including OHV use, backcountry camping, mountain biking, rock climbing, and on-road sightseeing, with expected increased visitation to the adjacent national parks and national forests, and foreseeable increases in demand for recreational facilities and recreational opportunities. Mineral exploration, development and extraction, including oil and natural gas well drilling, are expected to increase over the next 15 to 20 years.

The potential cumulative impact of Alternative A combined with past, present, and reasonably foreseeable future actions on visual resources could adversely affect visual resources and scenic quality from increasing minerals and recreation-related surface disturbances, and from wildland fire risks. However, mitigation would likely limit the impacts in viewsheds with high scenic quality in the MPA and in the adjacent national parks and national forests.

4.3.24.16.2 Action Alternatives-Alternatives B, C, and D

Past and present management, and reasonably foreseeable future actions, combined with the proposed action alternatives (Alternative B, C, and D) would have cumulative impacts on visual resources that preserve scenic quality within the MPA. The risks of wildland fire would be reduced within the MPA and on adjacent national forests through increased vegetation treatments to reduce fuel loads; recreation activities and off-road travel would be managed to limit surface disturbances by greatly reducing areas open to OHV use so that areas inventoried as having high scenic quality would be preserved. Mineral exploration, development and extraction, including oil and natural gas well drilling, are expected to increase over the next 15 years to 20 years, but visual resource management and associated mitigation would likely limit the impacts in viewsheds with high scenic quality in the MPA and in the adjacent national parks and national forests. Visual resource management would include conformance of minerals exploration and development activities with VRM Class objectives, which would preserve scenic quality in the long-term in areas that the MPA has designated for scenic quality protection.

4.3.24.17 WOODLANDS

The cumulative impacts of past, present, and reasonably foreseeable future actions would have long-term, beneficial and adverse impacts on woodland resources. Under the guidance of the Moab Fire Plan, and fire plans in adjacent BLM and USDA Forest Service Districts, fuel load reductions, vegetation treatments, and woodland salvaging would reduce the risks of wildland fire and long-term loss of woodland resources and productivity within the MPA. These activities (including stand thinning and salvage of dead, diseased, and infested trees) would also improve woodland resource productivity by indirectly improving woodland ecological conditions. Woodland productivity would be lost as woodlands were converted into rangeland for increased livestock forage. Cumulative travel management impacts would be beneficial to woodland resources because surface disturbance and soil loss would be lessened. Other resource use management actions would have adverse impacts on woodland resources by restricted resource harvesting (WSAs and Wilderness Areas, ACECs, SRMAs, and wilderness characteristics areas), and would continue to restrict resource harvesting in the future; however, the area of harvesting restrictions would be relatively small compared to the area managed as open to opportunities for resource harvesting.